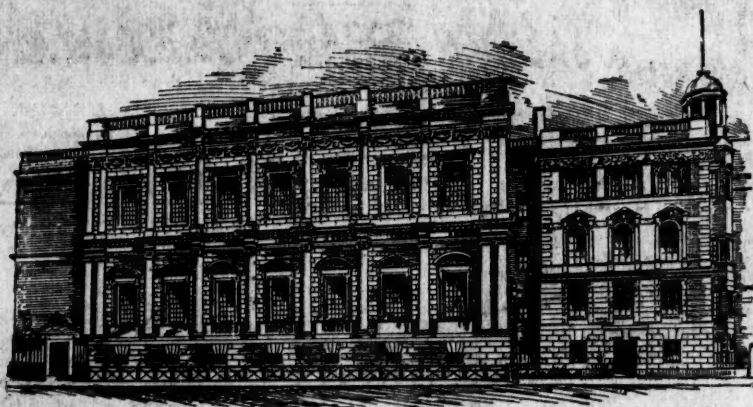


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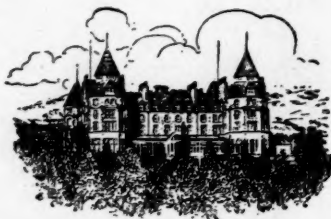
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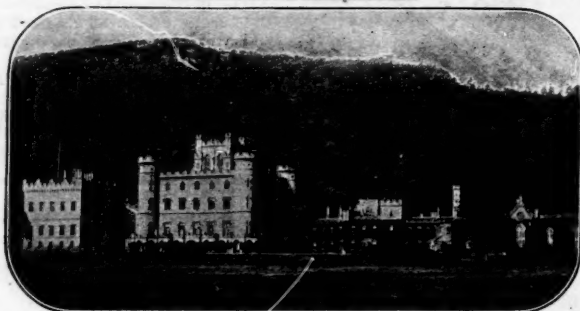
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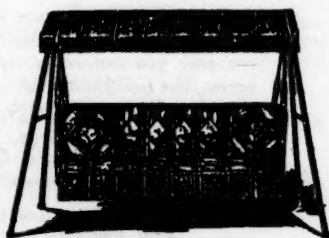
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| 1887. No Medal awarded. | 1913. Major A. Lawson, 2nd Drags. |
| 1888. Captain J. F. Daniell, R.M.L.I. | 1914-15-16-17. No Medals awarded. |
| 1889. Captain H. F. Cleveland, R.N. | 1918. Lieutenant W. S. R. King-Hall,
R.N. |
| 1890. Captain G. E. Benson, R.A. | 1919. Colonel J. F. C. Fuller, D.S.O.,
Oxford & Bucks L.I. |
| 1891. Captain R. W. Craigie, R.N. | 1920. No Medal awarded. |
| 1892. Lieut.-Colonel J. Farquharson,
C.B., R.E. | 1921. Flight-Lieutenant C. J. Mackay,
M.C., D.F.C., R.A.F. |
| 1893. Commander F. C. D. Sturdee,
R.N. | 1922. Major R. Chenevix - Trench,
O.B.E., M.C., Royal Corps of
Signals. |
| 1894. Major F. B. Elmslie, R.A. | 1923. Captain A. H. Norman, C.M.G.,
R.N. |
| 1895. Commander J. Honner, R.N. | 1924. Major L. I. Cowper, O.B.E.,
King's Own Royal Regiment. |
| 1896. Captain G. F. Ellison, Queen's
Royal West Surrey Regiment. | |
| 1897. Commander G. A. Ballard, R.N. | |
| 1898. Captain W. B. Brown, R.E. | |
| 1899. Commander G. A. Ballard, R.N. | |

RECIPIENTS OF THE CHESNEY GOLD MEDAL

(With rank of Officers at the time of the Award.)

- | | |
|--|---|
| 1900. Captain A. T. Mahan, United
States Navy. | 1914. Sir Julian S. Corbett, LL.M.,
F.S.A. |
| 1907. Major-General Sir J. F. Maurice,
K.C.B., p.s.c. | 1919. Major-General E. D. Swinton,
C.B., D.S.O. |
| 1909. Hon. J. W. Fortescue, M.V.O. | 1921. Major-General Sir C. E. Callwell,
K.C.B. |
| 1910. Sir J. K. Laughton, Knt., M.A. | 1924. Professor G. A. R. Callender,
M.A., F.S.A. |
| 1911. Professor C. W. C. Oman, M.A.,
F.S.A. | 1925. Captain Sir George Arthur Bart.,
M.V.O. |
| 1913. Colonel Sir L. A. Hale. | |



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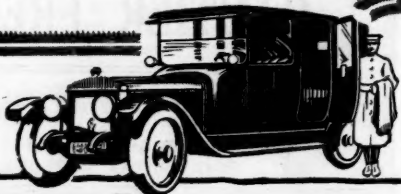
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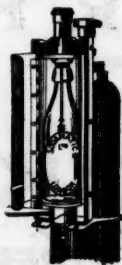
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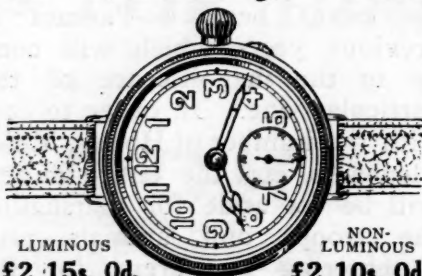
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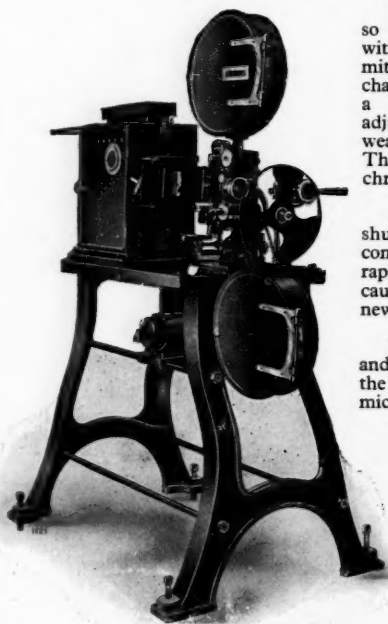
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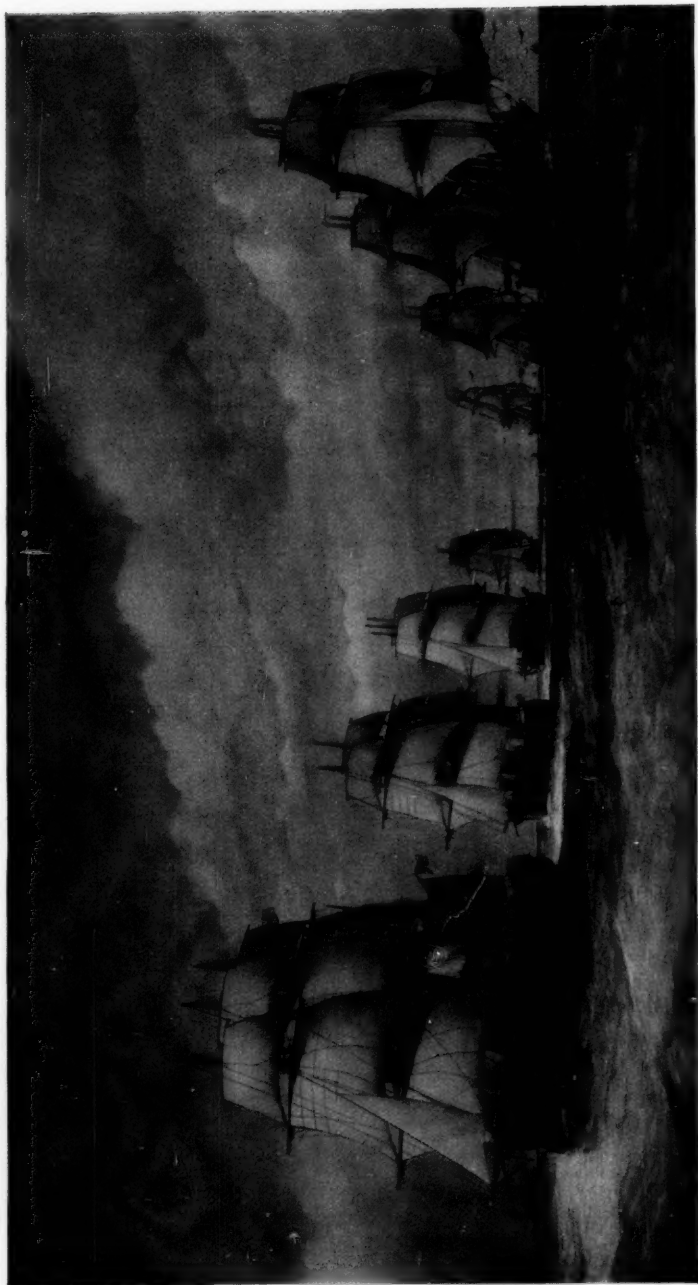
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SECRETARY'S NOTES.

MAY, 1925.

I.—Vice-President.

The Council regret to report the death of Field-Marshal Lord Grenfell, G.C.B., G.C.M.G., a Vice-President of the Institution.

Field-Marshal Sir W. R. Robertson, Bart., G.C.B., G.C.M.G., K.C.V.O., D.S.O., has been elected a Vice-President of the Institution *vice* Field Marshal Lord Grenfell, deceased.

II.—Council.

Lieut.-General Sir H. S. G. Miles, G.C.B., G.C.M.G., G.B.E., C.V.O., has resigned his seat on the Council.

In accordance with Chapter IV., paragraph 9 of the Bye-Laws, General Sir George F. Milne, G.C.M.G., K.C.B., D.S.O., General Officer Commanding-in-chief, Eastern Command, has been elected a Member of the Council *vice* Lieut.-General Sir H. S. G. Miles; and Major-General Sir E. Peter Strickland, K.C.B., K.B.E., C.M.G., D.S.O., General Officer Commanding, 2nd Division, Aldershot, *vice* Field Marshal Sir W. R. Robertson, Bart.

III.—Chairmen of the Council.

General Lord Horne, G.C.B., K.C.M.G., has been elected Chairman of the Council for 1925–1926.

Vice-Admiral Sir H. H. Bruce, K.C.B., M.V.O., has been elected Vice-Chairman for 1925–1926.

IV.—Council Committees.

The Committees of the Council are now composed :—

Finance.—Colonel C. W. Trotter, C.B., T.D.; Colonel A. S. Bates, D.S.O., T.D.; Colonel C. H. Colvin, C.B., D.S.O.; Major-General H. D. Farquharson, C.M.G.; Brig.-General The Earl of Lucan, K.B.E., C.B., T.D., A.D.C.; Admiral Sir R. G. O. Tupper, G.B.E., K.C.B., C.V.O.; and Captain Sir D. Wilson-Barker, Knt., R.N.R.

Journal and Library.—General Sir E. G. Barrow, G.C.B., G.C.S.I.; Major-General Sir J. T. Burnett-Stuart, K.B.E., C.B., C.M.G., D.S.O.; Brig.-General J. E. Edmonds, C.B., C.M.G.; Lieut.-General Sir J. A. L. Haldane, G.C.M.G., K.C.B., D.S.O.; Professor Sir Charles Oman, K.B.E., M.A., F.S.A., M.P.; Air-Commodore E. R. Ludlow-Hewitt, C.M.G., D.S.O., M.C.; Rear-Admiral C. M. Staveley, C.B., C.M.G.; and Admiral Sir R. G. O. Tupper, G.B.E., K.C.B., C.V.O.

Museum and General Purposes.—Colonel C. H. Colvin, C.B., D.S.O.; Colonel Lord Amptthill, G.C.S.I., G.C.I.E.; Lieut.-General Sir Noel Birch, K.C.B., K.C.M.G.; Major-General H. D. Farquharson, C.M.G.; Major-General The Earl of Scarbrough, G.B.E., K.C.B., T.D.; and Captain Sir D. Wilson-Barker, Knt., R.N.R.

V.—New Members.

The following Officers joined the Institution during the months of February, March and April, viz. :—

Lieutenant P. H. M. Cann, I.A.
 Captain A. C. Curtis, M.C., I.A.
 Lieutenant U. O. V. Verney, Rifle Brigade.
 Captain G. C. Winckley, M.C., Royal Corps of Signals.
 Captain H. S. S. Pringle-Pattison, M.C., Queen's Own Cameron Highlanders.
 Captain H. E. J. Beal, I.A. (R. of O.).
 Lieutenant S. W. Lushington, R.N.
 Lieutenant T. J. W. Winterton, R.A.
 Flight-Lieutenant S. E. Toomer, D.F.C., R.A.F.
 Lieutenant Hon. N. A. S. Lytton, Rifle Brigade.
 Lieutenant M. A. Maude, R.N.
 Lieut.-Commander H. D. Nichol, R.N.
 Captain R. C. Berkeley, M.C., late Rifle Brigade.
 Lieut.-Colonel Hon. C. M. Hore-Ruthven, C.M.G., D.S.O., Black Watch.
 Lieutenant M. R. Caldwell, R.E.
 Lieutenant C. D. H. Parsons, Queen's Royal Regiment.
 Second-Lieutenant W. L. South, 28th Bn. London Regiment (T.A.).
 Lieutenant H. F. Vinden, Suffolk Regiment.
 Captain H. D. Weir, Royal Marines.
 Lieutenant G. Turner, M.C., South Staffordshire Regiment.
 Squadron-Leader J. J. Breen, R.A.F.
 Captain C. S. Tuely, Manchester Regiment.
 Lieutenant E. R. Sword, 4th Queen's Own Hussars.
 Lieutenant V. C. Dunfee, 1st Cadet Bn. Royal Fusiliers.
 Captain R. S. MacFarlan, R.N.
 Lieutenant C. J. Shaw-Mackenzie, M.B.E., Seaforth Highlanders.
 Colonel F. S. G. Piggott, D.S.O., late R.E.
 Captain C. H. Kuhne, D.S.O., M.C., A.M.I.M.E., R.A.S.C.
 Captain A. W. S. Mallaby, I.A.
 Captain F. A. Hamer, Royal Marines.
 Lieutenant T. Kimber, R.E.
 Lieutenant W. A. Hopkins, late R.N.V.R.
 Lieut.-Commander C. P. Satow, R.N.
 Lieutenant T. Ivor-Moore, M.C., Royal Tank Corps.
 Captain W. R. Bucknall, Black Watch.
 Second-Lieutenant W. B. Hancock, Royal Fusiliers.
 Captain H. Wright, M.B.E., M.C., Gordon Highlanders.
 Lieutenant G. W. Beazley, Royal Marines.
 Lieutenant J. H. Moxham, Royal Marines.
 Flight-Lieutenant G. S. Reed, O.B.E., F.R.G.S., R.A.F.

Major H. O. Wiley, M.C., 5th/6th Dragoons.
 Captain L. A. Kenworthy, late I.A.
 Major-General Sir H. J. Everett, K.C.M.G., C.B., late Somerset Light Infantry.
 Captain E. G. Pemberton, Northumberland Fusiliers,
 Paymaster-Commander G. Solfleet, R.N.
 Captain A. C. St. Clair-Morford, M.C., Royal Marines.
 Major M. A. B. Johnston, M.C., R.A.
 Lieutenant E. A. E. Bolton, R.E.
 Captain J. C. McCarthy, late R.F.A.
 Major H. W. Hall, M.C., late Queen's Bays.
 Second-Lieutenant F. C. Ihlee, J.P., late 4th V.B. East Surrey Regiment.
 Lieutenant G. M. B. Burt, I.A.
 Major F. FitzGibbon, D.S.O., R.A.
 Lieutenant G. C. P. Menzies, R.N.
 Lieut.-Colonel G. V. Hunt, D.S.O., R.A.S.C.
 Lieutenant R. B. Scott, Duke of Wellington's Regiment (S.R.).
 Captain J. Lindsell, M.C., Loyal Regiment.
 Major V. Coates, I.A.
 Captain N. Douglas-Stephenson, M.C., The Loyal Regiment.
 Captain J. A. Glegg, I.A.
 Captain D. H. Nicholson, M.C., The Royal Scots.
 Lieutenant R. K. Dickson, R.N.
 Lieutenant E. K. Page, M.C., R.A.
 Lieut.-Colonel G. R. Crouch, M.C., Bucks Bn., Oxfordshire and Buckinghamshire Light Infantry (T.A.).
 Captain H. A. Fagan, D.S.O., M.C., I.A.
 Captain T. N. Smith, I.A.
 Squadron-Leader C. W. Mackey, R.A.F.
 Lieutenant C. R. A. Swynnerton, North Staffordshire Regiment.
 Major P. Hennessy, D.S.O., M.C., R.C.A.S.C.
 Captain C. L. Lewis, I.A.
 Lieutenant H. B. Golden, R.E.
 Lieutenant E. G. Ponsonby, 6th Bn., Queen's Royal Regiment (T.A.).
 Lieut.-Colonel A. M. Mills, D.S.O.
 Captain A. M. L. Harrison, M.C., I.A.
 Lieutenant F. E. M. Barford, Essex Regiment.
 Lieutenant F. E. W. Simpson, R.E.
 Major W. H. Lang, I.A.
 Lieutenant W. W. Haddock, R.A.
 Lieutenant V. J. L. Napier, M.C., South Wales Borderers.
 Captain B. E. Hallett, I.A.
 Flight-Lieutenant A. G. Jones-Williams, M.C., R.A.F.
 Lieutenant W. J. Humphrey, M.C., King's Regiment.
 Group-Captain W. F. MacNeece, C.B.E., D.S.O., D.F.C., R.A.F.
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 Squadron-Leader L. T. N. Gould, M.C., R.A.F.
 Lieutenant H. B. Martini, R.A.
 Lieut.-Colonel A. E. Norton, D.S.O., West African Regiment.
 Lieutenant J. D. Prentice, R.N.
 Captain I. A. Roche, I.A.
 Captain E. N. Goddard, O.B.E., M.C., I.A.

VI.—Letters.

Members are reminded that the Council can accept no responsibility in the matter of letters and telegrams addressed to them at the Institution, there being no arrangement for the reception and forwarding of letters, etc.

VII.—Cleaning of the Museum and the Institution Building.

The Institution and Library will be closed for cleaning from Monday, 10th August, to Saturday, 22nd August, inclusive, but the Museum will remain open.

VIII.—Important Standing Order.

A Member in arrear with his annual subscription, after 31st March of each year shall not be entitled to use the Institution buildings, receive the *Journal*, or participate in any of the privileges accorded to Members.

IX.—New Members.

A form is inserted in every *Journal* for the benefit of those Officers who may wish to join the Institution. The filling up of the form and its transmission to the Secretary is all that is necessary in the case of Officers whose names appear or have appeared in the Official Lists. The Council hope that Members will circulate these forms.

X.—Museum Purchase Fund.

This Fund has been opened with the object of purchasing suitable exhibits which are from time to time offered to the Museum, or which are put up for sale at various auctions. The Council hope it will receive support from Members of the Institution who are interested in the Museum.

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B. E. Sargeant, Esq., O.B.E., M.V.O., F.S.A.	3	3	0
	68	10	0
Less expended to date	35	0	10
	<u>£33</u>	<u>9</u>	<u>2</u>

XI.—Regimental Colours.

The Institution is prepared to arrange for the repairs to Regimental Colours and Cavalry Standards, in service or otherwise, and placing the new Battle Honours on the King's Colour. Inquiries having been made as to the cost of such repairs, the Secretary begs to state that the average cost is from £8 to £10 a Colour, of which the Institution only receives £1, to cover the cost of materials, carriage, etc.; Battle Honours, 2s. 6d. each.

The Colours of the following Regiments have been restored, etc., by the Institution since the publication of the last list:—2nd Bn. The Buffs, Welsh Guards, 3rd Bn. Worcestershire Regiment, 2nd Bn. Royal Warwickshire Regiment, 3rd Bn. Queen's Royal Regiment, 2nd Bn. East Lancashire Regiment, 2nd Bn. Royal Berkshire Regiment, 1st Bn. Essex Regiment, 3rd Bn. King's Own Scottish Borderers, 2nd Bn. South Staffordshire Regiment, 1st Bn. King's Own Royal Regiment, 1st Bn. Royal Irish Fusiliers and a Spanish Flag, 1st Bn. Sherwood Foresters, 2nd Bn. Royal Irish Fusiliers, 2nd Bn. Royal Fusiliers, 1st Bn. Gloucestershire Regiment, 29th Foot, 30th Regiment, 26th Bombay N.I., I.A., 31st Punjabis, I.A., 20th Bombay N.I., I.A., Q.O. Bengal Native Light Infantry, 8th (K.G.O.) Light Cavalry, I.A., 19th Bombay N.I., I.A., 4th Bn. West York Militia, Leeds Rifle Volunteers, Trumpet Banner King George III. period, Royal Elthorne Militia, 1st Bn. Royal Guernsey Light Infantry, 5th Bn. British Spanish Legion, Chinese Flag.

XII.—The Museum.

The amount taken for admission to the Museum during the past quarter was :—

£45 17s. 6d. in February.

£56 13s. 6d. in March.

£103 19s. 6d. in April.

(7855) A Mezzotint Engraving of Field-Marshal Lord Hill, G.C.B., Commanding-in-Chief of His Majesty's Forces, engraved by C. Turner, A.R.A., from the painting by H. W. Pickersgill, R.A. —Given by Caroline, The Viscountess Hill.

(7856) A small Line Engraving of Major-General The Earl of Lucan, K.C.B., etc., who commanded the Cavalry in the Crimean Campaign.— Given by The Curator.

(7857) A regulation Trooper's Sword which was taken from the body of a 12th Lancer who was killed close to the Berea Trench Mission Station in Major-General Cathcart's engagement with the Basutos on 20th December, 1852. The Rev. Maitin-Casalis buried the Lancer with others of the same regiment and of the Cape Mounted Rifles, retaining this sword.—Given by S. A. Maitin-Casalis, Esq.

(7858) A gold Casket presented with the Freedom of the Borough of Shrewsbury to Field-Marshal Lord Hill, G.C.B., bearing the following inscription :—

“ To Lieutenant-General Lord Hill, Baron of Hawkstone and Almaraz, K.B., late representative of the Borough of Shrewsbury, in token of their high admiration of his distinguished military talents so often and so eminently displayed in the service and honor of his Country in Portugal, Spain, and the South of France, and in testimony of their esteem for his private virtues, this box, together with the Freedom of the Town: 1814.”

- (7859) A circular Silver Box with Coat of Arms embossed on the lid bearing the following inscription :—
" The Freedom of the Borough of Plymouth to Sir Rowland Hill, K.B., George Bellamy, Esq., Mayor, 1812."
- (7860) A Box of Heart of Oak. On a gold tablet on the lid is inscribed :—
" To Lieutenant-General Rowland Lord Hill, Baron Hill of Hawkstone and Almaraz, G.C.B. :
" In token of their high admiration of his military talents and private work, this Box, together with the Freedom of the Guild, is most respectfully presented by the unanimous vote of the United Company of Mercers, Grocers, Ironmongers and Goldsmiths of Shrewsbury, 1817."
- (1) Inside the box is a letter from the Warden conveying the information; and (2) a draft of Lord Hill's reply; (3) copy of the resolution and an intimation from the Town Clerk of the City of Cork that Major-General Rowland Hill had been presented with the City's Freedom, 18th July, 1808.
- (7861) A *papier-mâché* Snuffbox used by Field-Marshal Lord Hill throughout the Peninsula War. It was given to his valet by him and subsequently passed through various hands, eventually being returned to Lord Hill in 1899.
- (7862) A small Silver Cup bearing the following inscription :—
" Lieut.-Colonel Hill, 90th Regiment, Egypt, March, 1811. Gift to Sir R. Hill when a child."
- (7863) A leather Helmet of the 90th Light Infantry, the crest and plume are missing (but were the same as that of the Light Dragoons of the period); it has the Light Infantry bugle badge in front, with "90" inscribed thereon. It was worn by Field-Marshal Lord Hill when Colonel Commanding the 90th Regiment at the battle of Aboukir, in which engagement he was wounded by a musket ball which first struck the peak of this helmet and damaged it.
- (7864) A small leather travelling Dressing-case which belonged to Field-Marshal Viscount Hill, G.C.B., and used by him throughout the Peninsula and Waterloo Campaigns. It contains 7 silver-topped glass bottles of various shapes and 14 toilet instruments."
- (7865) A General Officer's Sword, bearing the following inscription :—
" Presented to General Lord Hill, G.C.B., General Commanding-in-Chief, on 19th May, 1832, by King William the Fourth."
- (7866) A Light Cavalry Sword with embossed brass handle, which belonged to Field-Marshal Lord Hill, G.C.B., and used by him as Colonel Commandant of the North Shropshire Yeomanry Cavalry.

- (7867) A Handsome dress Rapier with embossed gilt handle, bearing the following inscription :—

" Presented by the Corporation of the City of London pursuant to a vote of the Common Council passed the 12th July, 1813, the Right Honourable George Scholey, Mayor, to Lieutenant-General Sir Rowland Hill, K.B., in testimony of the high sense this Court entertains for his public services in the skill, bravery, and exertions so eminently displayed on 21st of June (1813) when the French Army was completely defeated at Vittoria by the Allied forces under the command of Field-Marshal the Marquis of Wellington."

- (7868) A pair of Civil Swords (masonic) with gilt handles, and a scabbard and belt of crimson velvet, which belonged to Field-Marshal Lord Hill, G.C.B.—The whole of the foregoing were given by Caroline, The Viscountess Hill.
- (7869) A plaster Bust of Field-Marshal Sir George White, V.C., G.C.M.G., G.C.V.O., G.C.S.I., O.M. (1835-1912).—Given by the Sculptor, John Tweed, Esq.
- (7870) Tricoloured Cockade and red cloth base to French grenade Badge, taken from the Field of Waterloo, which belonged to Field-Marshal Lord Hill.—Given by Caroline, The Viscountess Hill.
- (7871) Shoulder-belt Plate of a Scotch local Militia or Fencible Regiment, which belonged to Field-Marshal Lord Hill.—Given by Caroline, The Viscountess Hill.
- (7872) Two small and curious French " Bonbon des Modes " given to Field-Marshal Lord Hill by H.M. Queen Adelaide in 1832; the paper with them bears her signature.—Given by Caroline, The Viscountess Hill.
- (7873) Field Canteen which formerly belonged to Major-General Patrick Mackenzie and used by him throughout the Peninsula and Waterloo campaigns; it is very complete, with the various necessary articles (list inside the canteen). This Officer served from 1781 to 1819 in the 77th, 1st, 43rd, 81st Foot, which latter regiment he commanded from 1804 to 1813; he retired in 1819.—Given by Colonel W. Mackenzie Smith, D.S.O., T.D.
- (7874) A Spear Head of the late Bronze Age found in Shropshire, from the collection of the late Field-Marshal Lord Hill, G.C.B.—Given by Caroline, The Viscountess Hill.
- (7875) A heavy Cavalry Officer's Sword with brass hilt embossed with the Royal Crown by Wilkinson, which belonged to Field-Marshal Lord Hill.—Given by Caroline, The Viscountess Hill.
- (7876) Officer's dress Sword, 2nd Life Guards, which belonged to Field-Marshal Lord Hill.—Given by Caroline, The Viscountess Hill.

(7877) A contemporary coloured plan of the order of the Battle of Dettingen (17th June, 1743).—Given by Lieut.-Colonel The Lord Cottesloe, V.D.

(8244) (a) Miniature Portrait of Surgeon Samuel Scott, Surgeon 6th Dragoon Guards, 1816. Born 1780, died in Edinburgh, 1825.

(b) Miniature Portrait of Captain Brabazon Connor of Cloyne and Jigginstown, Adjutant, Royal Regiment of Limerick Militia, 1801-1825. Born 1782, died 1843.—Given by Lieut.-Colonel M. F. Scott, T.D.

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UNDER SAIL AND STEAM.

THE CHANNEL SQUADRON IN 1872.

By L. G. CARR-LAUGHTON.

THE frontispiece to this issue of the *Journal* is from a picture of the Channel Squadron in 1872, painted by W. F. Mitchell for Admiral Sherard Osborn. After Admiral Osborn's death the picture was acquired by the late Mr. Spencer Butler, by whom it was presented to the Institution. It is now hung on the landing, outside the Secretary's office.

The period is an interesting one of transition, from wood to iron, and from sail to steam. It will be noticed that, if this period be reckoned as extending from the Crimean war, which caused the building of the first armoured vessels, to 1890, when the Channel Squadron had shed the last of the masted ironclads, the year 1872 falls in the very middle of it.

The "Minotaur" became flagship of the Channel Squadron in 1867, at which time there was no second flag, and so continued till 1872. In 1870 her sister ship, the "Agincourt," joined as second flagship, and in 1873 relieved her as flagship of the C.-in-C., the "Sultan" then having a commodore's broad pendant as second in command. At the end of the year the "Northumberland," the third ship of the "Minotaur" class, became second flagship; and there was no further change till 1876, when the "Minotaur" again became flagship. For the next two years the "Black Prince" and "Warrior" in succession hoisted the second flag, but in 1879 the "Agincourt" relieved the "Warrior."

From 1879 to 1887 inclusive the "Minotaur" and "Agincourt" were the two flagships: in 1888 the flags were in the "Northumberland" and "Agincourt," in 1889 in the "Northumberland" and "Anson," and in 1890 in the "Camperdown" and "Anson." The transition was then complete, and mastless ships had ousted the rigged ships from our first line.

In 1872 the squadron was composed of the "Minotaur," flag (launched in 1863), and her sisters the "Agincourt" (1865), second flag, and "Northumberland" (1866). The other armoured ships were the "Bellerophon" (1865), "Hercules" and "Monarch" (1868), and the "Sultan" (1870). The frigate "Topaze" (1858) was lent from the detached squadron. It should be noticed that, though the "Monarch" really belonged to the squadron, she was not in fact in commission in this year.

Responsibility for the change rested partly with steam, but chiefly with the guns. By 1860 the Navy had nearly 40 years' experience of steam, and it still had seen no reason to depart from the simple broad-side ship. Armour had been introduced, it is true, but it was still quite thin, its purpose being to keep out shell fired from smooth bore guns. The "Warriors" had $4\frac{1}{2}$ in. of iron, the "Minotaurs" $5\frac{1}{2}$ in., with which thicknesses it was possible to cover the greater part of the sides. But about 1862 the competition between guns and armour began. At the beginning of the period the guns in use for capital ships were:—

Calibre.	System.	Weight of Gun.	Weight of Projectile.	
(a) 8.05 - -	Smooth bore	65 cwt.	(Shell gun).	
(b) 8.12 - -	Smooth bore	95 cwt.	68-pr.	
(c) 7.0 - -	B.L.	82 cwt.	110-pr.	} Armstrong.
(d) — - -	B.L.	60 cwt.	70-pr.	
(e) — - -	B.L.	32 cwt.	40-pr.	

The regular armament for capital ships in the early 60's consisted of (b) and (c) of the above, and the "Minotaurs" were originally intended to be so armed. Indeed, the 68-pr. had proved remarkably efficient on trial, and, though very shortly superseded in large ships, it continued to be mounted in frigates and the smaller classes. But between the dates of the "Minotaur's" design and completion there was a great change, the old smooth bores and Armstrong guns giving place to the newly invented rifled muzzle-loaders. These were:—

Calibre.	Weight of Gun.	Weight of Projectile.	Length of Gun.	When introduced.
(f) — - -	64 cwt.	64 lbs.	10 ft.	1864
(g) 7-in. - -	$6\frac{1}{2}$ tons	115 lbs.	11 ft.	1865
(h) 8-in. - -	9 tons	180 lbs.	12 ft.	1864
(i) 9-in. - -	12 tons	250 lbs.	13 ft.	1864
(j) 10-in. - -	18 tons	400 lbs.	15 ft.	1866
(k) 12-in. - -	25 tons	600 lbs.	15.2 ft.	1867

The increase in the power of guns was met by a greater thickness of armour, and the later ships of the 60's had belts which were 9 in. thick amidships and 6 in. at the ends. The "Monarch" had a 6-in. belt and 10 in. on her turrets, all the armour being of iron.

It resulted from these rapid changes that no ship was completed to her original design. Thus when, as was the case with the "Minotaurs," the attempt was made to build three ships to a class, the last ship differed considerably from the first. But, apart from the relatively minor differences between individual ships of a class, the squadron, and the fleet at large, was composed of widely differing types.

The "Minotaurs" were intended to be broadside frigates, mounting 50 guns, which (referring to the list above) were to be: on the main deck 26 (b) and 8 (c); on the upper deck 6 (c) and 10 (d). The "battle of the guns" altered all this, and eventually they were all completed to carry rifled muzzle-loaders, thus:—

"Minotaur"	Main deck	4 (i) and 18 (g).	Upper deck	4 (g).
"Agincourt"	"	" 4 (i) and 20 (g).	"	" 4 (g).
"Northumberland"	"	" 4 (i), 18 (h) and 2 (g).	"	" 4 (h).

The additional pair of 7-in. guns in the two later ships were mounted in the stern, but not firing in chase. These were the armaments carried in 1872; but at the end of that commission it was decided to re-arm the class, and in the next year the first two were given a one-calibre main armament of 17 (k), which they kept as long as they remained on the effective list; that is, for another 20 years, but the "Northumberland" kept her 12-in. guns.

These ships were of the then unprecedented length of 400 ft., and were rigged with five masts, their main yards being of the moderate length of 91 ft. They were reported on as good sea boats, able to fight their guns in weather when most ships would not be able to open their ports, but very unhandy except when under steam. It was constantly suggested that their rig should be altered either to four or three masts, but no change was made till long afterwards, though it was under consideration in this year, 1872. The "Northumberland," in 1879, was the first to have her rig reduced to three masts: the others kept their original masts till after 1890.

A report by Sir William Fanshawe Martin (the original "Pincher" Martin) of an inspection of the "Northumberland" made on 21st September, 1868, shows how gradually the ways of the old simple, wooden ships were being adapted to altered conditions:—"It will be so difficult to keep in good order the guns and their delicate appliances that the utmost care will be required, even in a fine climate, to preserve them in an efficient state Whilst the battery deck is frequently cleaned with sand and 600 men mess between the guns, it seems almost impossible to keep the guns and their gear in such working order as they should at all times be. In the fitting, therefore, of similar ships, it may be worth considering if they could not be so arranged that the men might mess

before and abaft the battery bulkheads. The battery might still be used for many men to sleep in."

The unhandiness of these ships and their weakness in end-on fire were disadvantages which Mr. (afterwards Sir Edward) Reed, who became chief constructor in 1863, set himself to overcome in their successors. The "Bellerophon," "Hercules" and "Sultan" were all typical Reed ships. Like the "Minotaurs" they had a complete water-line belt of armour, but, instead of having the armour carried up over nearly the whole length of the main deck, to protect the guns mounted in broadside, they had a short box central battery amidships.

In the "Bellerophon," the first of the type, the battery was square and gave no end-on fire, to gain which a small additional armoured battery of two guns was placed in the bows on the main deck. Chase guns were also added abaft, but were removed before 1872. The vicissitudes of the "Bellerophon's" armament were numerous, but less extreme than those of her predecessors, for the 9-in. 12-ton gun was introduced while she was building, and it was possible to arm her with it. She had ten of these guns in her main battery, and after several changes, two 7-in. M.L.R. as bow chasers. The concentration of the armament in relatively few heavy guns, in lieu of its dispersal in twice or three times the number of lighter pieces, was an important factor in the design of the ship; for it made it possible to shorten her greatly, and thereby to save much in the weight of the armoured belt. Thus the "Bellerophon" was 300 ft. long, 100 ft. less than the "Minotaurs," and displaced some 7,000 tons as against their designed displacement of 9,870 tons, which was much exceeded on service. She and her successors were given a three-masted ship rig, with which for ironclads they sailed fairly well. Soon, however, it was seen that the yards on the mizzen mast were useless, and, if shot away in action, were likely to cause danger by fouling the screw. The captain of the "Bellerophon" reported against them in March, 1872, and they were afterwards removed in all capital ships.

The "Hercules," as first designed, was only 5 ft. longer than the "Bellerophon," but with 3 ft. more beam, and displacing nearly 1,000 tons more. It was then intended to arm her with 9-in. guns; but meanwhile a 10-in. 18-ton M.L.R. was brought out, and on 16th January, 1866, it was approved to lengthen her by 20 ft. so that she might carry this gun. Her displacement was thereby increased to 8,592 tons. As completed she had eight of the 10-in. guns in the main deck central battery, which had recessed ports at its extremities so that one pair could fire nearly ahead and another pair nearly astern; and on the same deck she had two 9-in. M.L.R., mounted singly in small armoured batteries at the bow and stern. On the upper deck she had four 7-in., not behind armour, firing in chase. She retained this armament throughout her career.

She was reported on as the best sailing ship of the ironclads. Once the "Sultan" beat her, but this was thought to be due to the "Sultan"

having a cleaner bottom. It was a difficulty of the early iron ships that their bottoms could not be coppered, and, in fact, none of those in the squadron in 1872 were coppered, though the practice of applying a wood sheathing to which to fix the copper was first introduced experimentally in 1870.

The "Sultan" was virtually the same size as the "Hercules," and carried the same armament in the main central battery, but without the recessed ports at its after end. She differed from earlier ships by having also a central battery on the upper deck, but this was small, being only a third of the length of that below it. In 1870 this upper battery was armed with four 9-in. M.L.R., the after pair firing from before the beam to right astern; but this arrangement was only arrived at after several changes. Once reached, however, it was adhered to. This principle of a central battery on two decks, both mounting heavy guns, was further developed in later ships, reaching what was perhaps its high-water mark in the "Alexandra" of 1875. But the introduction, or rather the re-introduction, of the turret system of mounting heavy guns was already in the field as a rival, and the days of the belt and battery design were drawing to an end.

The "Monarch," launched in 1868, was designed by the Controller's Department while E. T. Reed was chief constructor, but was understood to be only partly representative of his views. She was 330 ft. long by 57 ft. 6 in. beam; that is, 5 ft. longer and 1 ft. 6 in. narrower than the "Hercules" and "Sultan," and her designed displacement was 8,164 tons. She was fully rigged, with fore and main yards of 105 ft., which Sir H. Yelverton reported in 1871 to be far too big for her, suggesting their immediate reduction. They were cut down by 9 ft. early in 1872. The report went on: "She is not a handy ship, and requires the greatest care and attention at all times. On all occasions of sailing she has been last; and at times, when under sail alone and without steam, she becomes unmanageable, to the risk and peril of those around her."

What is probably the chief interest of this ship is that she was built at the same time as the ill-fated "Captain," and was nominally of the same class. Both ships were turret ships, and both were fully rigged. Reed, however, had nothing to do with the design of the "Captain," which was lost—so far as any one feature was responsible for her loss—because her low freeboard did not give her the necessary stability when heeled under canvas. The "Monarch" had not this fault, her freeboard being a deck higher, and proved stable enough, though a very bad sailer. The general arrangement of her armour was that of the normal Reed ship. She had the complete water-line belt, with a box of armour amidships above it; but this box was not pierced for guns, its use being to protect the bases of the two turrets which were placed on the centre line of the ship. Each turret mounted two 12-in. guns (*k*). Like the contemporary central-battery ships the "Monarch" had a small armoured battery in the bows (this being on the upper deck) and another in the stern. She mounted 7-in. guns in these positions, two before and one

abaft, but at a later date exchanged these for two 9-in., one at each end of the ship.

There was only a fractional difference of speed between all these ships. In the sixties 14 knots was the standard speed aimed at for ironclads, and all of the ships in question made that or more on trial, the "Monarch," with 14.9 knots, having the highest record. The engines were of the simple horizontal type, the boilers were rectangular, steam pressure was limited to 30 lbs., and each ton of engines and boilers produced little more than 6 I.H.P. Even these figures represented a very great advance in the course of 30 years, and the steaming power of the ironclads was thought very satisfactory. By later standards their fuel consumption was high, probably averaging over 3 lbs., and the amount of fuel carried was small, ranging from 610 tons in the "Hercules" to 810 tons in the "Sultan"; but by Sir Edward Reed's figures the "Bellerophon" and later ships could steam 2,000 miles or more at 11 knots, and the "Minotaurs" 1,500 miles. This was probably a theoretical estimate, for Brassey at a later date gave the radius as about 20 per cent. below Reed's figures, at a speed of only 10 knots.

Inevitably all these ships had rams. It will be remembered that in the later ironclads the bowsprit became nearly horizontal, instead of steeping up in the old way. This came from bedding the bowsprit on the topgallant forecastle in order that it might be quickly cleared "for action and for running down vessels." The torpedo in use was the Harvey patent, from which great things were hoped. It was carried by all ships, and the flagship carried a commander additional "to instruct in Harvey's torpedoes." This torpedo was put into the water when wanted and was towed on the quarter, having an otter attachment which made it take an angle from the towing ship. Its bursting charge was 60 lbs. guncotton or 85 lbs. of blasting powder. In 1872 the Whitehead locomotive torpedo was still in the early experimental stage in this country, though it had been adopted in the Austrian navy some five years before.

The only ship of the squadron remaining to be mentioned is the "Topaze," a wooden steam frigate launched in 1858. As first designed she was to be of 2,356 tons builder's measurement; that is to say, as big as the first-rates of 1815. She was enlarged by 300 tons before completion, and, when converted into displacement, her tonnage worked out at 3,879. With a main yard of 96 ft. she was a good sailing ship, and the returns credit her with 13.5 knots with the wind abeam, 13 knots with it on the quarter, and 10 knots when close hauled. She was designed to carry 30 8-in. guns (a) on the main deck, with 20 32-prs. on the upper deck; but the course of invention altered all this, and after several changes she settled down in 1870 to an armament of four 7-in. M.L.R. and sixteen 64-prs. M.L.R. (f) on the main deck, with eight of the 64-prs. on the upper deck.

The difference between the systems of engine room staffs in those days and these is very noticeable. For horse-powers which hardly

exceeded 8,000 these ships carried each a chief engineer, from six to eight engineers, and one or two assistant engineers. Even the frigate had a chief and four engineers. There was an Inspector of Machinery in the flagship, with an engineer as his assistant; these, in modern phrase, being staff officers. There was then no First Captain, but the heads of departments of the flagship acted, in the old traditional way, as staff officers for the squadron.

In 1872 the Commander-in-Chief of the Squadron was Rear Admiral Geoffrey T. Phipps Hornby, who had already acquired a great service reputation both as a disciplinarian and as a tactician. From the Channel he went to the Admiralty as Second Sea Lord; and in January, 1877, being offered either the post of First Sea Lord or the Mediterranean Command, chose the latter. The time was a difficult one, owing to the Russo-Turkish war then raging, and in February, 1878, the Russian army being within striking distance of Constantinople, Hornby was ordered to take the fleet through the Dardanelles. There was no opposition and the movement was successful. Hornby became in 1881 President of the College at Greenwich, and in November, 1882, was appointed C.-in-C. at Portsmouth. In 1885, the last summer of his command, he hoisted his flag in command of an evolutionary squadron in the exercises which developed into the annual naval manoeuvres. For many years before his death, in 1895, he was recognised as the highest authority on both strategy and tactics.

His Flag Lieutenant in 1872 was James A. T. Bruce, who, in 1895, became senior officer at Gibraltar, and during the Boxer rebellion was second in command on the China Station.

Commander Archibald L. Douglas was borne in the flagship as instructor in the use of Harvey's torpedoes. In 1898 he became C.-in-C. East Indies, was Second Sea Lord 1899-1902, C.-in-C. N. America and W. Indies 1902-04, and C.-in-C. Portsmouth 1904-07.

The First Lieutenant was Alfred Jephson, who will be remembered as the organising secretary of the great Naval Exhibition of 1891, for which service he was knighted.

Another lieutenant of the flagship was G. H. U. Noel, who gained distinction in 1898 as second in command in the Mediterranean at the time of the Cretan troubles; was Admiral commanding the Reserves in 1900 and at the time of the formation of the Home Fleet; was C.-in-C. China in 1904, and C.-in-C. at the Nore in 1907.

A. L. Winsloe, then a sub-lieutenant, commanded the Cruiser Squadron in 1900, and became C.-in-C. China in 1910.

Frederick E. E. Brock, then a midshipman, commanded the Portsmouth Division of the Home Fleet in 1909, became S.N.O. at Gibraltar in 1912, and from 1916 commanded in the Orkneys and Shetlands.

Charles H. Cross, also a midshipman in the "Minotaur," also commanded the Portsmouth Division of the Home Fleet from 1905, and in 1908 became Admiral Superintendent at Devonport.

Wm. M. Dowell was captain of the "Hercules" in 1872. He had

already been Commodore on the W. Coast of Africa in 1867, and at the Cape in 1869. As Rear-Admiral in 1877 he was second in command in the Channel; in 1879 became senior officer on the Coast of Ireland; in 1884 was appointed C.-in-C. China; and in 1888 hoisted his flag as C.-in-C. at Devonport.

His commander was H. H. Rawson, who was appointed C.-in-C. at the Cape in 1895, a command which included an expedition in E. Africa in 1896, and the more serious one to Benin in 1897. He commanded the Channel Squadron in 1898; and in 1902 was appointed Governor of New South Wales.

John Ingles, then a lieutenant of the "Hercules," went out as naval adviser to the Japanese Government in 1887; and in 1894 became Superintendent of the Royal Gun Factory at Woolwich.

John C. Burnell, also a lieutenant, was Superintendent of Sheerness Dockyard in 1895, and afterwards reached the flag list.

Also in the "Hercules" was William H. May, who became captain of the "Excellent" in 1897, Director of Naval Ordnance in 1901, Controller of the Navy 1901-04, C.-in-C. Atlantic Fleet 1905, Second Sea Lord 1907, and C.-in-C. of the Home Fleet in 1909.

Percy M. Scott, then a midshipman, revolutionised naval gunnery by his methods first introduced in the "Scylla" in 1896, and in the "Terrible," which he commanded during the S. African war; his improved gun-mountings for field service were of considerable value in the campaign against the Boers. He was captain of the "Excellent" in 1903, and in 1905 was appointed to the newly created post of Inspector of Target Practice. He commanded Cruiser squadrons from 1907-09, and afterwards received a grant of £2,000, and a baronetcy, for his services to naval gunnery. Perhaps his greatest achievement was in perfecting, little more than a year before the Great War, the system of Director Firing, which, in its old crude form, was in use when he was a midshipman.

The Hon. Maurice Bourke, another midshipman, was captain of the "Victoria," Sir George Tryon's flagship in the Mediterranean, when she was sunk in 1892. He was among the saved, but did not serve again.

Sir R. S. Lowry was a midshipman in the "Northumberland." In 1907 he was Rear-Admiral in the Channel Fleet, then he commanded the R.N. War College at Portsmouth, next the Second Cruiser Squadron, from November 1908-10, and in 1913 he hoisted his flag at Rosyth as Senior Officer on the Coast of Scotland.

A. K. Bickford was a lieutenant of the "Topaze." He became Superintendent of Sheerness Dockyard in 1898, and in 1900 was appointed C.-in-C. in the Pacific.

Charles H. Coke, a midshipman of the same ship, was Senior Officer on the Coast of Ireland in 1911, and was again re-appointed to the same post in May, 1914.

The Hon. A. G. Curzon-Howe, in 1872 a sub-lieutenant of the "Bellerophon," was second in command in China in 1903; Vice-Admiral

in the Home Fleet in 1905, Commander-in-Chief of the Atlantic Fleet in 1907, and of the Mediterranean Fleet in 1908. In 1910 he became C.-in-C. at Portsmouth.

Captain E. W. Vansittart commanded the "Sultan," and in 1873 as commodore was second in command of the squadron. He had the reputation of an admirable seaman; and the story goes that, being caught by the newly-introduced age limit and put upon the retired list, he shipped before the mast in a ship bound round Cape Horn by way of proving to their Lordships that he was not too old to serve.

Douglas A. Gamble was a midshipman with him: he commanded the Sixth Cruiser Squadron from 1910-12, and the Fourth Battle Squadron in the war of 1914.

The second in command of the squadron was Rear-Admiral Reginald J. G. Macdonald. His captain was E. S. Adeane, who in 1891 was second in command of the same squadron; and his commander was C. C. P. Fitzgerald, who was second in command in China in 1897 after having been Superintendent at Pembroke, and was later well known as an author and controversialist.

John Lovell Robinson deserves mention. He was then naval instructor in the "Agincourt," but afterwards, having taken orders, was for many years Chaplain at Greenwich.

The number of distinguished officers who served in these ships in later years is legion, and, if space permitted, their names would recall an era which forms the human link, as the ships themselves mark the material link, between the era of masts and sails and the steam navy of to-day.

THE "ECOLE SUPERIEURE DE GUERRE," PARIS.

The author of the article on this subject, which appeared by permission of the General Staff in the February number of the JOURNAL, is Lieut.-Colonel G. G. Waterhouse, M.C., R.E., p.s.c.

GOLD MEDAL (MILITARY) PRIZE ESSAY FOR 1924.

SUBJECT:

"GIVEN THAT THERE IS MAINTAINED AT HOME IN PEACE TIME A FIELD ARMY OF FIVE REGULAR AND FOURTEEN TERRITORIAL DIVISIONS, WITH ARMY TROOPS: HOW CAN THEY BEST BE ORGANISED TO PROVIDE FOR EXPANSION WHICH A WAR ON A NATIONAL SCALE WILL DEMAND?"

By MAJOR L. I. COWPER, O.B.E., The King's Own Royal Regiment.

MOTTO: "*Perseverentia et industria.*"

PRELIMINARY.

- (i) A Mechanical Army. (ii) Military Administration and Policy.
(iii) Statistics

A PROPOSED METHOD OF EXPANSION FOR THE NEXT WAR ON A NATIONAL SCALE.

- (iv) Moral Factors. (v) A suggested Scheme. (vi) Training. (vii) The Regular Army. (viii) The Territorial Army. (ix) The Reserve Battalion. (x) Young Soldiers. (xi) The Supply of Junior Officers. (xii) Senior Officers. (xiii) Promotion in time of war. (xiv) Mobilisation.

PRELIMINARY.

(i) *A Mechanical Army.*

THOSE prophets who, in the years before 1914, proved the impossibility of war wrote most convincingly, yet the coming of Armageddon was not retarded. So long as the population of the earth continues to increase so that the great mass of the people can barely subsist, so long will the struggle for bread lead to war.

But while it is easy to foresee wars, it is not easy to foresee their nature. Colonel Fuller, in his book "*The Reformation of War,*" visualises the fighting forces of the nations as entirely mechanicalised—with a largely increased Air Force, whose chief weapon is gas, the Navy fighting not on but under the sea, and the objective no longer the defeat of the enemy's armies but the destruction of his Government's moral.

It is doubtless true that the great men of war have been those able to think farther ahead than their opponents; such men of vision are of supreme value to their country; it is nevertheless the first duty of the soldier to put the men and material available to the best possible use, facing war as he knows it.

This is not to say that science will not be increasingly applied to the weapons of war. In this matter the soldier will keep an open mind and the Intelligence Branch will be diligent to search out any changes of this sort in the war plans of potential enemies.

Aeroplanes, tanks and tractors are still in their infancy as weapons of war. It is impossible to foresee what developments may take place in them after a few months of warfare, but it is certain that their evolution would be rapid and the types in existence when war breaks out might be obsolete within a few months. Clearly financial considerations forbid the supply in peace time of large numbers of such machines; the small amount of money available is better spent in research and experiment than in production.

When war broke out in 1914 the first consideration was to get command of the sea. The outbreak of the next war may find us faced with the necessity of obtaining command of the air before the Navy can leave its harbours. This will entail a much enlarged Independent Air Force to seek out and destroy the opposing air forces. In addition, we must be prepared for an air offensive against our large towns. During the last war the Germans brought over 21 aeroplanes and effected almost nothing. It may be argued that larger forces would not be more effective since nothing multiplied equals nothing. This would be a bold assumption; for with a little luck much damage might have been done; we must also allow for the invention of some specially virulent gas which might be devastating in its effects. A strong force of aeroplanes for home defence will have to be ready to meet these dangers.

But the strength of the Air Force is limited, of necessity, by the very high standard required of its personnel. The number of young men available as pilots, and of skilled mechanics for the maintenance of the machines is not unlimited. In November, 1918, the Air Force numbered 293,000. Even supposing this number can be doubled we arrive at a total of under 600,000, or not more than 12 per cent. of the total forces of the Crown.

The Navy will be unlikely to need more men than during the last war—the Washington Conference limiting the number of ships in peace and the time required to build ships and train men for the Royal Navy preventing rapid expansion in war. In 1918 the Navy amounted to 9 per cent. of the total forces of the Crown.

The peace establishment of Tanks as laid down by the Bird Committee is in the proportion of one tank battalion to a division of Infantry. The tactical use of Tanks is offensive, against a definite and located objective. Such objectives are not likely to number more than two on the frontage held by a division. One battalion of Tanks would cover

about half of the total frontage. It would seem that the numbers allowed for are approximately sufficient and would not exceed double their present proportion, or 17 per cent of the total forces of the Crown. To sum up: in a war when the national man power is fully mobilised the personnel of the Fighting Forces might well be distributed approximately as follows:—

Navy	9 per cent.
Air Force... ..	12 "
Tanks	17 "
Other Arms	62 "
<hr/>	
Total	100 "
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(ii) *Military Administration and Policy*

In Field Service Regulations we find the following passage:—
 "War is the ultimate resort of policy whereby a nation, when every peaceful means of settling an international dispute has failed, seeks to impose its will on its enemies in defence of its honour, its interest, or its existence." National policy then must be affected by the national preparedness for war. To embark on a policy which, logically followed out, will lead to war, without the military force to see it through, is to use the methods of poker in international affairs, and nations are not easily bluffed.

The Government of a country should be so organised in time of peace that no great change is necessary when war breaks out—for, "war being the ultimate resort of policy," the men who initiate and carry out that policy should be responsible for the conduct of the war to which it may lead.

A Cabinet numbering 22 is clearly not a suitable form of government for a nation at war; so much was proved in 1914. It is an axiom that no man is able to control directly more than eight subordinates. The government of this country should be in the hands of the Prime Minister, and not more than eight Ministers of Cabinet rank—one of whom should be Minister for Defence, and another Minister for Home Affairs (Such departments as the Board of Trade, Agriculture and Education could be controlled by under-secretaries, subordinate to the Minister for Home Affairs.)

Schemes of this kind were suggested by Sir Eric Geddes and by Sir Mark Sykes when giving evidence before the Sub-Committee of the Committee of Imperial Defence appointed by the late Mr. Bonar Law as Prime Minister, in March, 1923. But, largely because of the criticisms of Lord Haldane and Sir William Robertson, the Sub-Committee considered that the weight of expert opinion was against the creation of a Ministry of Defence, and decided to continue the

present policy whereby the Committee of Imperial Defence, presided over by the Prime Minister, is the supreme authority for questions relating to the Navy, Army, and Air Force. This Committee numbers 13—without the Minister for Home Affairs. Since this minister must be responsible for the mobilisation of the man power of the nation, and also for the control of national industry and commerce, his exclusion from the Committee of Imperial Defence is manifestly inadvisable.

It is not clear whether this Committee is merely a peace time arrangement to be replaced on the outbreak of war by a War Cabinet, such as proved necessary in 1914, or if it is intended to be the supreme authority for the carrying on of war. In the former case, all the difficulties and dangers of the last war will be repeated; even should the change be made immediately hostilities began there must be a period of friction before the new organisation runs smoothly. In the latter case, the numbers are too large, and it is difficult to see how they can be reduced without entirely altering the character of the Committee.

It seems to be clear, however, that these risks will have to be taken for the present. Though several of the witnesses, including Mr. Churchill and Sir William Robertson admitted that the creation of a Ministry of Defence would be the ideal solution of our difficulties, they were of opinion that such a change is impracticable at the present time. "When," as Mr. Churchill says, "'a common staff brain' has been evolved, able to advise the Cabinet on military questions, then only will it be possible to create a Ministry of Defence." A number of other questions will be solved when it is possible to bring the Ministry of Defence into being—the amalgamation of the services of administration of the three Services, the size and control of the Air Force, and, most vital of all, what Lord Salisbury's committee call the "Problem of the Predominant Partner." The present solution, of which Sir Charles Harrington's Command in Constantinople was a good example, places the three Services in the position of allies—one of whom, considered the most important, shall take command and be able to count on the loyal co-operation and assistance of the other two. This arrangement places too great a strain on human nature not to be liable to break down on occasions.

When in addition to the three Staff Colleges we have a joint Staff College for more senior officers, a beginning will have been made towards the creation of a new order of commander—not an Admiral, a General, or an Air Marshal, but, let us say, a Marshal, trained in Grand Strategy as it applies to all three Services, and selected by the Ministry of Defence to take command of combined operations as occasion shall arise. This is no more difficult to imagine than the emergence of a General in high command from a Gunner, a Sapper, or an Infantry man.

Pending the formation of a Ministry of Defence the mobilisation of the nation for war would be the province of the Minister for Home Affairs. The first step necessary is the preparation in peace time for the taking of a national register immediately on the outbreak of war. The control of the industrial and commercial resources of the nation

would also be by the same Minister, for in the last war it was found that men could be trained more quickly than they could be armed.

A necessary preliminary to the taking of a national register is the re-adjustment of military and civil boundaries. At the present time the boundaries of Commands are not co-incident with the County boundaries and Military Areas cut right across the County and Police Divisions. This is bound to cause friction even in peace time and in war would make the smooth running of a national scheme for registration extremely difficult.

(iii) *Statistics.*

Analysis of the statistics of the Great War 1914-1918 leads us to the following conclusions:—

1. From a total population of 42,000,000 about 3,800,000 would be available for the Army.
2. 38,000 men are required for each division in the field.
3. To maintain a division in the field at full strength 16,824 new men would be required annually.

In fixing the number of divisions it would be possible to maintain in the field, the principal difficulty is to estimate the probable duration of the war. Should the increased use of mechanism give movement the upper hand of fire, as seems probable, we may again see a war lasting only a few months. So far as this country is concerned, however, it must be at least four months from the outbreak of hostilities before any large force could become engaged. By that time the probable form and type of warfare would be indicated, and should circumstances justify the risk the whole weight of the nation could be used at once. But in preparing beforehand we cannot count on this, and a larger number of divisions should not be projected than can be maintained for a period of $2\frac{1}{2}$ to 3 years.

Including the Cavalry Division and the five Infantry Divisions of the Expeditionary Force a total of 48 Divisions would appear to be the largest number which could be maintained at full strength during a war lasting for that length of time.

It may be objected that this number is too small in view of the 70 aimed at by Lord Kitchener in the last War, and the 105 which, according to German ideas, we could raise from our population. It is true that a conservative figure has been taken; a smaller number of divisions fully up to strength and with adequate reserves for replacing wastage has been preferred as the basis of the scheme of expansion to a larger number for which reserves might not exist.

To elucidate points which arise later on in this essay it is necessary to give one more figure, viz.:—the permanent wastage of an Infantry Battalion, which amounted to 80 men a month. Details of the figures on which these conclusions are based will be found in Appendix A.

A PROPOSED METHOD OF EXPANSION FOR THE NEXT WAR ON A NATIONAL SCALE.

(iv) *Moral Factors.*

Napoleon's maxim that "the moral is to the physical as three is to one" has an obvious and direct meaning when we think of it as applied to actual warfare. No troops can be victorious without the will to victory. Though less obvious the maxim is equally true of questions of organisation and administration. No military system can be imposed upon an unwilling nation with any chance of success, and when considering what can be done to prepare the country in time of peace for the necessary expansion of its fighting power in time of war, the mentality of the people—their outlook and general characteristics—must be a fundamental consideration.

At the present time, in England, no system of compulsory military service has a chance of becoming law. Even the late war which showed conclusively the danger of unpreparedness has not affected the attitude of the nation as a whole on this point, and now we have actually a smaller army, both regular and territorial, than in August, 1914.

It is true that there are still a number of trained men who would be available if war broke out—but this number diminishes yearly and their value decreases with age and absence of training.

One vital lesson does seem to have been learnt: immediately on the outbreak of hostilities compulsory service could be imposed, and the more complete and immediate the application of it, the more readily will it be accepted. All that can be done now is to prepare a scheme for making the best use of that portion of the nation's manhood which would be available for the Army.

Two courses could be followed: either to use our present organisation as a framework and to adopt what may be called "increase by division" or "budding," to use a biological term, or to form new armies as was done in the last war.

The paramount advantage of the first course is continuity of tradition. *Esprit de corps* is the greatest moral factor in the making of an army.

In the Regular Army, before the war, Regimental tradition counted for everything, and during the period of service the Regiment stood for home wherever it happened to be stationed.

In practice, owing to the circumstance that the two battalions of a Regiment never met and habitually served at opposite ends of the earth, the basis of *esprit de corps* was frequently narrowed down to the battalion. Sometimes the feeling between the two battalions of a regiment was far from cordial, and in extreme cases amounted to positive hostility. But small-minded and parochial as some of the manifestations of *esprit de corps* might appear, it was realised that the very foundation of regimental life and efficiency depended on it—and

every possible means was taken to increase and foster it. Every recruit was instructed in regimental history. He lived in an atmosphere of tradition and moulded his life and conduct in accordance with what was, or was not, done in the Regiment. His barrack room was named after some regimental victory—the anniversaries of these victories were kept as regimental holidays—the glorious past of the Regiment was constantly before him, and officers and men alike could not escape from the responsibility of their inheritance. Instead of, and more difficult to break than the tie of blood was the tie of the Regiment. Officers' wives visited in Married Quarters, organised clubs and Provident Funds, helped with entertainments and treats. A magazine told news of past and present members of the Regiment, their wives and children: Old Comrades Associations were an annual opportunity for meeting; should a little capital be needed for a start in life, the Aid Fund would provide it; it killed in action a man's name was recorded in the Regimental chapel—alive or dead he belonged to his regiment.

Such was *esprit de corps* before the war, confined altogether to the Regiment. Pride of Brigade, of Division, of Command, was impossible in the Regular Army, owing to the conditions of service, which were such that a battalion might form part of a different brigade every year.

In the Territorial Army this was not altogether the case. Battalions remained always at home, and formed part of the same brigade and division year after year. Nevertheless, regimental *esprit de corps* was the life of the whole army, Regular and Territorial, until August, 1914.

On the outbreak of war we deliberately scrapped the whole system. Officers and men were drafted to different regiments. Commanding Officers and Adjutants were appointed irrespective of their corps. Only in Reserve battalions was any effort made to keep regimental *esprit de corps* alive.

But like most things which have been for years the habit of men's minds, *esprit de corps* survived, and reappeared later on in the war in an altered form. Men no longer talked of the marvellous deeds of their Regiments, or even Brigades: they "swopped lies" about their Divisions.

The Authorities, not yet content, hoped that "*esprit d'Armée*" would become the moving spirit, and amongst Commanding Officers and Staffs this pride of army did to some small extent develop. But so far as the rank and file were concerned, it did not, for the conception was too large to be grasped by the Junior Officers or the men. Theoretically, no doubt the broader idea is sounder. But *esprit de corps* should mean—and did mean—the complete subordination and forgetfulness of self for the good of the community and no larger entity than a Regiment can command this unselfish service and suppression of personal ambition.

Any future scheme for the expansion of the Army in time of war should recognise this fact and build on a foundation of regimental tradition, if the best results are to be obtained. In every branch, whether

Artillery, Cavalry, Engineers, or other Arms and Services, the foundation will be found broad and strong enough to support any weight.

With regard to Staff and General Officers the case is different. Personal ambition will make itself felt, and pride of regiment must give place to pride of army if the sense of proportion is not to be lost.

In the Regular Army *esprit de corps* is much again what it was, for the officers and non-commissioned officers who survived the war realise its supreme importance.

(v) A Suggested Scheme.

The essence of the scheme here outlined is the homogeneity of the Regiment in peace and the incorporation of its battalions in fighting Divisions in war.

For the sake of brevity it is proposed to deal only with the Infantry side of the question, on the grounds that one-third of the whole army consists of Infantry and that the essential ideas underlying the scheme can be applied equally to the other Arms.

Whatever may be the number of battalions raised, each unit, whether Regular, Reserve or Territorial, would inherit the full regimental traditions, draw its recruits from the same source and be led by its own officers.

To this end a Reserve Battalion would be created, the function of which in peace time would be the training of recruits and reserves of all kinds for the Regular Army, and which, in war, would be the sole source of supply of personnel up to, and including, the rank of captain, for all battalions of the Regiment.

The scheme is based on a decentralised organisation instead of one centralised in the War Office in London.

The Territorial Army as at present constituted, would provide the frame-work on which the National Army would expand, and the number of units of each regiment to be raised would depend on the number of territorial battalions of that Regiment now in existence, similarly with Artillery and other Arms and Services.

It is necessary to organise in peace time for the taking of a national register immediately on the outbreak of war. But, however speedily this were effected, recruits could not be immediately forthcoming, and to bridge the gap a Territorial Army Reserve would have to be formed.

(vi) Training.

Training, to be of any use, must be influenced by the probable conditions of the next war, and must be constantly modified as weapons are improved and scientific discoveries are applied to the conduct of war.

The training of the private soldier begins, as a recruit, with Individual Training. During this period he is taught all that it behoves the individual soldier to know—self-respect, self-reliance, self-control,

and the mastery of his weapons. These are concrete subjects and can be taught on definite standardised lines. Proficiency in them can be termed the mechanical part of soldiering.

The next stage, Platoon Training, continues the soldier's education as a member of a team, and at the same time gives the Section Leaders experience in commanding their men and co-operating with each other.

From now onwards, through Company, Battalion and Brigade Training, Divisional and Army Manœuvres, the private soldier is merely the material by means of which the various grades of leaders, from the Platoon Leader to the Army Commander, learn how to use their initiative and handle men in war.

Training, then, is of two distinct kinds, Mechanical and Tactical.

Tactical training can be infinitely varied and demands knowledge, initiative and intelligence on the part of the instructor. It is here that the good officer, of whatever rank, can impress his personality on his men.

The aim of peace training in a battalion is to maintain the standard of mechanical training, to organise a Headquarter Wing, and to produce leaders capable of commanding tactical units in war and fit to assume the duties of the next higher grade.

On mobilisation a proportion of these leaders would be withdrawn, and their places filled by promotion from the rank below. Meanwhile, battalions would be brought up to strength by a number of reservists proficient in mechanical training.

Given a really sound and scientific method of mechanical training battalions so constituted should show little or no variation in quality.

The object of Individual Training is to fit a man to take his place in a platoon as a trained soldier. To this end recruits should be trained in squads sufficiently large to allow of Platoon Training being carried out. Since wastage from disease or other causes is inevitable, the size of the original squad should be considerably more than 28. Probably 40 would be the best number for the standard squad—but this is a matter to be decided by investigation and experiment at Depôts.

The other thing to be ascertained is the number of weeks required to turn a recruit into a trained soldier. In order to find this out the number of subjects taught and the length of time allotted to each should be considered, and a definite decision arrived at. This would permit of a programme being made out giving the number of weeks to be taken, the number of hours worked in each week and the subject matter of each lesson.

Experiments at Depôts in peace time on these lines, would very soon give us definite information as to the minimum time necessary for what we have called above the Mechanical Training of the soldier—and on the outbreak of war the same system would be followed of training recruits. No cutting down of the time allotted would be possible, since a private soldier not up to this standard of Individual Training is useless in war.

During the last war a programme of training was evolved, but it did not specify in sufficient detail the instruction to be given, and the number of weeks allotted, and the number of hours worked each week were constantly being changed.

It should be clearly laid down that the number of hours worked cannot be extended whatever the emergency. Power of application is one of the things most important to teach and if recruits are expected to do 54 hours a week it is humanly impossible for them to concentrate on their work; in the end no time will be saved.

The Northern Command scheme fulfills many of the conditions required above, but it is open to criticism on various points. The size of the standard squad laid down does not allow enough margin for wastage, and the programme of work is given "as a guide" instead of being authoritative. Also the number of hours of work a week, 20 to 26, would appear too few. During the war, at one time, 54 hours was ordered. Something between these two figures is the amount required. Again, with regard to the monthly tests, it is not clear of what these consist. Another Army Form should be issued, rather on the lines of the Musketry Return, for the use of Company Officers.

In every branch of the Service a definite syllabus for the period of MECHANICAL training should be scientifically standardised and rigidly applied by expert trainers of recruits. Upon such a solid foundation the TACTICAL training of units by their own officers could be more rapidly developed than it is at present.

(vii) *The Regular Army.*

The Cardwell system of linked battalions has stood the test of time, and no considerable change is likely to be made in it. It provides us with our overseas garrisons and our Expeditionary Force at home, and though too small an army to be adequate for the many duties asked of it—if the nation is not prepared to spend more on insurance than at present we must be content with the quantity we have and concentrate on raising the quality as high as possible.

The problem of expanding the army on the outbreak of war is the problem of finding a sufficient number of instructors trained in peace time. A well-trained battalion can go on service with a large proportion of half-trained officers, and non-commissioned officers, for in war, providing that the Commanding Officer and the Regimental Staff are thoroughly competent, the qualities most valuable for leadership are courage, endurance, and commonsense.

On mobilisation, in 1914, regiments were brought up to strength with 50 per cent. of reservists, but they went abroad with 30 highly trained officers—nearly all of whom were killed or wounded within the first few weeks.

This system is obviously wasteful. At least 25 per cent. of the Officers and Section Commanders and 50 per cent. of the Sergeants

should be withdrawn on mobilisation to form training cadres for newly raised units. Those withdrawn should be men with special qualifications as instructors. In addition a number of regimental officers should be available for junior appointments on the Staff.

At present it is impossible to organise the work of a battalion in peace time so that the Commanding Officer has sufficient leisure for his principal duties—thought, inspection, and the training of officers and non-commissioned officers for war. The whole administration of the battalion should devolve on the Second-in-Command, who, in addition, is responsible for the education of all ranks and the training of newly joined officers. If the Second-in-Command is to do his work thoroughly he must have assistance: two captains should be appointed for periods of 12 months to assist the Second-in-Command—one representing the G. branch, the other being responsible for Q. For this purpose two captains should be added to the establishment. In this way a number of young officers would gain an intimate knowledge of the working of a battalion, and at the same time learn something of office management and staff duties. They would moreover make up for the shortage which battalions now suffer from in peace and would be invaluable on mobilisation for war.

In peace time there is always an unfortunate tendency to concentrate on the administration of a battalion and allow its war training to take second place. Generals and Commanding Officers are human—and it is easier to detect administrative faults and omissions than to estimate the amount of training done and its relative value. For this reason it is essential that the Commanding Officer should be able to depend on his Regimental Staff and senior officers to take over all administration, routine work, education and so on. His duty is to train the officers and non-commissioned officers for war.

(viii) *The Territorial Army.*

What motive influenced Lord Kitchener in 1914 when he raised "Kitchener's Army" instead of expanding the already existing Territorials cannot be known with certainty. He probably regarded the latter as a shifting and insecure foundation since they were not liable for service out of England.

The force has now been reconstituted on lines identical with the Regular Army. The majority of the officers and non-commissioned officers have war experience and the standard of efficiency attained by the units is such as to make them capable of forming the framework on which a national army could be built up.

The present strength of the Territorial Army is 14 Divisions. The man power of the nation would permit of its expansion to 42 Territorial Divisions. This means that it would be increased three-fold—each division providing the nucleus on which its successor would be raised. On the declaration of war each Territorial Division would mobilise in its Peace Station. Units without Stations would be concentrated

at Unit Headquarters—and on the completion of mobilization the whole division would concentrate in its War Station. Meanwhile the Divisional Commander would arrange to replace any officers who, from one cause or another, were unfit for war. In addition 25 per cent. of selected officers and non-commissioned officers would be withdrawn to form a nucleus to raise and train the next line. One of the officers so withdrawn should be either the Commanding Officer himself or a senior major with local knowledge and influence.

In place of the 25 per cent. of officers left behind the Divisional Commander would appoint a like number from the pool of officers of the Reserve Battalion.

This process would be repeated with the raising of each new division as the national emergency developed.

National Registration, which would come into force on the outbreak of war, could not supply men for the immediate expansion of the Territorial Army. The interval between mobilisation and the time when conscripted recruits become available would be bridged by the formation in peace time of a Territorial Reserve. If the terms of enlistment were for twelve years—four with the Colours, and eight with the Reserve—sufficient men would be available to fill the ranks until such time as the National Register became operative. It is not anticipated that this change would prejudice recruiting for the Territorial Army.

To revert to our Territorial Division, mobilised at its War Station.

Rapidity of training to enable it to take the field as soon as possible in support of the Expeditionary Force is essential. To this end all men who had not done "Mechanical Training" and passed their tests would be replaced, and would proceed to the Reserve Battalion to be trained. Their place would be taken by Territorial reservists. The units would then be at full strength, and three months of tactical training would fit them for service overseas.

Meanwhile, the 2nd Line would be forming at the Peace Station, and would in due course move to its War Station, its place being taken by the 3rd Line.

This being the scheme for the embodiment and expansion of the Territorial Army, its training in peace time should be planned with a view to producing trained units in the shortest possible time.

The standard required from the rank and file of the Territorial Army would be the same as that attained by a man of the Regular Army when he leaves his Regimental Depot; that is to say, his Mechanical Training would be completed and he would have passed the required tests. The bounty should be dependent on his having acquired this standard.

It should be so arranged that the first year's training with a Territorial Unit would represent the first month of the regular recruit's training at the Depot. Similarly with the second, third, and final years.

Each year in the Reserve the Territorial would pass again the same tests receiving therefor a small emolument.

For the examination of non-commissioned officers for promotion

no syllabus is laid down in King's Regulations. This should be done and the same tactical standard required as for the Regular Army.

With regard to the training of officers also, the same standard of tactical knowledge should be required, for the essence of a trained unit is its commander.

(ix) *The Reserve Battalion.*

Before the war the personnel at the Regimental Depôt fulfilled two rôles :—

1. The training of recruits for the Regular Battalions and for the Special Reserve.
2. The provision of a cadre of officers and non-commissioned officers of the regular Army on which the Special Reserve was built up when called out for training or on mobilisation.

No alteration is suggested except that the Depôt and Special Reserve Battalion would be merged in one unit called the Reserve Battalion.

In peace Time the functions of the Reserve Battalion would be :—

1. To train the recruits of the Regular Army.
2. To train recruits enlisted on the same terms as the recruits of the former Special Reserve.
3. To test annually Regular Reservists and Special Reservists (that is, the men specified in 2 above).
4. To carry out the annual training of Special Reservists, and of Regular Reservists as required.

Men who enlist in the Special Reserve would be trained alongside the recruits of the Regular Army in the Reserve Battalion, the latter being drafted to a unit on the completion of training, while the former return to civil life.

Men from the Regular Army transferring to the Reserve would normally be Trained Soldiers. If not they should be paid at a lower rate than men who pass their tests. Reservists would come up annually to be tested, and they should be classified accordingly.

The annual training of both the Regular Reservists and the Special Reservists should be the same, the end in view being the attainment of proficiency in Mechanical Training.

The establishment of the Reserve Battalion in peace time should be about 1,000. This would allow for the replacement of six months' casualties in the battalion allotted to the Expeditionary Force, and five months in the Foreign Battalion.

The Reserve Battalion should be organised in four companies, graduated according to their proficiency in training, and a Cadet Company for the training of young officers. (This Company would come into being on mobilisation.)

In peace time the command of the Reserve Battalion would be exercised by the Officer now commanding the Regimental Depôt, while its officers and non-commissioned officers would be found from a special

branch of the Reserve. This special branch would consist largely of officers retired from the Regular Army before attaining the rank of major, and the establishment would be completed by the recruitment of a number of young officers of the same class as formerly joined the Militia. The Training of these officers would be at the Depôt up to and including the standard required in the syllabus laid down for the instruction of a Platoon Commander.

As an inducement to take a commission in the Reserve Battalion young Officers would be allowed to use it as a stepping-stone to a commission in the Regular Army, whilst those who preferred to remain in the Reserve would be promoted in the ordinary way up to the rank of captain.

The establishment of non-commissioned officers would be found from non-commissioned officers of the Regular Army who, when leaving their units elected to remain on the Reserve for a further term of years.

To meet the requirements of a modern army, large numbers of skilled tradesmen are needed and the old Militia might be revived for such men. No useful purpose would be served by reforming infantry battalions of Militia.

On the declaration of War all Regular and Special Reservists would report themselves to the Reserve Battalion.

After supplying the needs of the Expeditionary Force all surplus reservists, including Territorials, would be trained and tested in the Reserve Battalion and when Mechanically trained, drafted to units as required.

In addition the Reserve Battalion would serve as an educational establishment for the instruction of young officers and non-commissioned officers, and casualties from all battalions of the Regiment would join it on discharge from hospital.

In peace time, as noted above, the Depôt Commander would be in command of the Reserve Battalion. But a new appointment would be created—for which officers who had recently vacated command of one of the Regular Battalions would be eligible. This appointment would be for four years and would carry the rank of full Colonel, but without pay or allowances in peace time. On the outbreak of war this officer would at once assume command of the Reserve Battalion and be responsible for the training and drafting of reinforcements of officers and men, up to and including the rank of captain, for all battalions of the Regiment.

During the war it would be necessary to keep in the Reserve Battalion sufficient private soldiers to replace the wastage of all battalions of the Regiment on service for a period of three months.

Calculating the casualties in accordance with paragraph III, we find that the average number of casualties per month, per battalion, was 80. The maximum number of men under training in the Reserve Battalion to replace casualties for a regiment with eight battalions all on service at the same time would be about 2,000 men. This means

that the numbers in the Reserve would vary from one to two thousand—one thousand being the Peace Establishment and two thousand the normal number required for war. In the event of heavy casualties it might be necessary further to increase the numbers in a specified Reserve Battalion. There would be no objection to this, additional companies being formed as required. During the last war it was found possible to train 3,000 men with a Reserve Battalion on an emergency.

In regiments with more than two territorial battalions the size of the reserve would have to be greater, and might necessitate the formation of two or more battalions. In no case, however, would more than four Reserve Battalions be required, and these could all be supervised by one man, as a sort of Brigadier of Training.

(x) *Young Soldiers.*

During the first few months of war, while new units are in process of formation, the age of enlistment should be raised to 19, as at this time no experts would be available for the training of youths. As soon as possible, however, Young Soldier Battalions and Graduated Battalions should be formed and trained on the plan which was so successful in the last war. A company, when fully trained, should be transferred to the Reserve Battalion, and they would then be available for drafting in the same way as the older men.

It is essential that these young soldiers should begin their army life wearing the same badges as the Regiment with which they are to fight. For this reason a Young Soldiers' Battalion should either be all of one regiment, under officers of that regiment, or it should be made up of companies belonging to different regiments in the same territorial group. The number of young soldiers allotted to a regiment would depend on the number of battalions of that regiment on service.

(xi) *The Supply of Junior Officers.*

In time of war, the provision of a sufficient number of Junior Officers to replace casualties and to be appointed to newly raised units is a problem not easily solved. Beyond the Reserve of Officers the only sources of supply are the Officers' Training Corps, promotion from the ranks, and the Royal Military Academy and the Royal Military College.

Unfortunately, the training of an officer cannot be unduly hurried. Though the supply of Platoon Commanders is all that is being considered here, the young officer must be proficient himself in Mechanical Training, and must be able to instruct in it. In addition, a knowledge of Section Leading and minor tactics equivalent to Certificate B. for officers from the Officers' Training Corps is absolutely necessary. At least four months' training under expert supervision is required, over and above the time necessary to make him a trained soldier.

Each new infantry battalion needs 30 officers below the rank of major. This means that an infantry regiment consisting in peace time

of two Regular and two Territorial battalions would need on expansion 120 junior officers in the first six months. The replacement of casualties must also be provided for. Analysis of the figures of the last war for one regiment consisting of twelve battalions in the field, gives the average number of nearly four officer casualties a month in each battalion. On this basis, the total number of young officers required during the first year for new units and replacing casualties would be about 500—and subsequently to maintain eight battalions in the field some 32 a month would be needed.

It must be anticipated that the casualties of the Expeditionary Force in the first three months would very greatly exceed the average. The additional number of young officers required must be found from the Reserve of Officers; by shortening the period of training and doubling the number of students at Sandhurst and Woolwich, by selection from the members of the senior division of the Officers' Training Corps and by promotion from the ranks in the field. These are emergency measures.

The normal method of the supply and training of young officers in time of war should be :—1st, Sandhurst and Woolwich; 2nd, by means of the Cadet Company of the Reserve Battalion.

In England the education and training in the Public Schools is entirely different from that in Board Schools. Public School boys do not leave school till the age of 18, and while there they are taught leadership and self-control, the two first qualities needed in an officer. Over and above this it has been proved a thousand times, both in time of war and in time of peace, that, generally speaking, officers should not belong to the same social class as their men. Men recommended for commissions for distinguished service in the field are, of course, an exception to this rule.

The ranks of the Cadet Company of the Reserve Battalion would be filled from these two sources—Public School boys, and men recommended in the field for commissions.

With regard to Public School boys, on the outbreak of war a boy would apply at the Headquarters of the Command in which he lived for a nomination to a Cadet Company. This application would be accompanied by a school leaving certificate, or a document of a similar kind from a University.

Boys still at school would put down their names for regiments as is done at Sandhurst. If possible they would be sent to the Cadet Company of the regiment chosen.

On arrival with the Reserve Battalion cadets would be immediately tested and dealt with accordingly. If not "mechanically" proficient they would be trained with the recruits. They would learn to be Instructors and Section Leaders with the non-commissioned officers' class, and would then pass into a Cadet class for Platoon Commanders.

Normally, for men already mechanically trained, a period of four months should be enough. The Cadet would then be examined, and

if the result were satisfactory and he was recommended by the Commanding Officer, he would receive a commission. During his training as a Cadet he would live under the same conditions as the men, but in separate barrack rooms and with a separate dining hall. He should be dressed as a private soldier with a white band on his cap.

The Cadet Companies of Reserve Battalions would not be able to produce the officers required for the first months of the war by the above method, since the training would take four months. There should be available, to bridge the gap, a number of members of the Senior Division of the Officers' Training Corps who would be able to pass all their tests at once, and these would receive immediate commission on the recommendation of the Officer Commanding the Reserve Battalion. At any time when junior officers were urgently required the same process could be followed, a given number of Cadets being specially recommended for commissions—their training being completed with their units.

Cadets who failed to pass the final examination, or who, during their training showed themselves unfitted to become officers would be transferred to the ranks and made available for drafting.

"A new scheme has just been brought out under which, in the event of a war in which the Territorial Army is mobilised, Officer Cadet Units are immediately formed at the Universities to take on the training of all candidates for the Territorial Army or temporary commissions. All undergraduates in possession of certificate A. will be eligible for commissions at once, and all others over the minimum age for enlistment can be enlisted at once in a 'Reception Unit' and will then be transferred to the Officer Cadet Units of the Arms they wish to join, in batches of increasing size to meet the requirements of expansion."* In the writer's opinion this scheme has three defects:—

1. The peace time standard of training in the Senior Division of the Officer's Training Corps is not comparable to that of Woolwich and Sandhurst, and it would take time to bring it up to that standard—whereas the expert staff would be immediately available with the Reserve Battalion.
2. It is inadvisable to make a man an officer unless he possesses the required discipline. If a Cadet, for this or any other reason, showed himself unfitted for a commission, time would be wasted in transferring him to another unit.
3. The final decision as to whether a Cadet is suitable for a commission should rest with a senior officer of the Regiment with which he is to serve. Also Cadets training with an Officers' Training Corps at the University would not during that time absorb regimental *esprit de corps* or traditions.

* Extract from a lecture delivered before the Royal United Service Institution on Wednesday, 5th March, 1924, on the Supply and Training of Officers for the Army, by Colonel the Hon. M. A. Wingfield, C.M.G., D.S.O., General Staff, War Office.

The personnel of the Training Cadre should consist of the best and most fully qualified officers and non-commissioned officers. This will be possible on mobilisation since the training experts of the Peace Establishment of the Reserve Battalion will be available, supplemented by selected officers and non-commissioned officers of the Reserve and officers and non-commissioned officers withdrawn from Regular Battalions on the outbreak of war.

It is desirable that the personnel of the Training Cadre should be changed at intervals and officers and non-commissioned officers with recent war experience appointed in order that training may be kept up to date. At the same time in all training a certain amount of continuity is essential, and some officers and non-commissioned officers have more natural aptitude than others for this special work.

(xii) *Senior Officers.*

At the present time there are a large number of junior officers on the Reserve, but this is a result of the late war, and in normal times the majority of retired officers liable to be recalled are of field rank.

Up till now these officers have received their orders direct from the War Office. This system should be abolished except in the case of substantive colonels and those of higher rank. Junior Officers—subalterns and captains—as already described, will be at the disposal of the Colonel Commanding the Reserve Battalion. For majors and lieutenant-colonels another arrangement should be made.

Immediately on the outbreak of war a Senior Officers' School should be started in each command, run on the lines of the one now at Sheerness. Here all Field Officers would report on mobilisation and would be put through a course of training, as would officers of the same rank withdrawn when their units went on service, and those discharged from hospital.

These schools would serve two purposes: the training of senior officers, and their classification according to their suitability for various employments.

The schools should be situated somewhere near Command Headquarters so that the G.O.C.-in-C. would have an opportunity of becoming acquainted with the officers.

All Field Officers required for the Reserve Battalion, Commanding Officers and Senior Officers for units in process of formation and Second Grade Staff Officers would be selected from amongst the students at these schools by the G.O.C.-in-C. Command. He would normally appoint officers to units of their own regiment—but in order to widen the field of selection the regiments in the Command would be grouped territorially and Commanding Officers selected from amongst those of the same group.

(xiii) *Promotion in Time of War.*

As regards the promotion of officers in time of war substantive promotion should cease on mobilisation, to be adjusted at the cessation of hostilities.

Promotion should be of two kinds—Acting Rank, which would only be for such time as the officer was actually holding the position carrying the rank in question, and Temporary Rank which, for the duration of the war, would replace Substantive Rank. For this Temporary Rank an officer would be eligible after holding the Acting Rank for a period of six months with an Expeditionary Force, if recommended by his Commanding Officer and confirmed by the next superior in rank.

(xiv) *Mobilisation.*

The difficulty and disorganisation caused by mobilisation for war can be reduced immeasurably by efficient preliminary organisation and careful decentralisation.

If the National Registration Scheme becomes operative immediately war is declared and if reserves for the 1st and 2nd Line are available an exact time-table can be adhered to.

Billetting Areas for Divisions in England, supplies of arms, equipment, clothing and food could be worked out in peace time. This is of primary importance, for during the last war men could be trained more quickly than they could be armed and equipped.

Similarly, the policy to be followed with regard to the location of the Reserve Battalion should be prepared and accommodation found for the Senior Officers' Schools in the various Commands. Probably the plan followed during the last war of stationing Reserve Battalions at a distance from their home counties gives the best results. The Depôts in this case are only responsible for receiving recruits and providing them with uniform.

The scheme for mobilisation in England would be divided into three phases—during which War Stations would have to be found for the following numbers of divisions:—

1st Phase ...	...	0-21 days ...	...	10 Divisions.
2nd „ ...	...	21-35 „ ...	...	26 „
3rd „ ...	...	35-61 „ ...	...	42 „

This scheme allows for the despatch overseas of divisions as they are trained and ready—in addition, four territorial divisions are detailed to embark at once to replace regular divisions brought back from garrison duty abroad.

Divisions should be ready to go on service as follows (the dates are calculated from the outbreak of war):—

1 Cavalry Division and 5 Infantry Divisions	after 14 days.
12 more Divisions	after 4 months.
16 „	after 5 months.
14 „	after 9 months.
a total of 48 divisions.	

This may be taken as an optimistic estimate of what would be possible, and it may be that after the first few months a slowing down would be inevitable. But the quicker the nation can mobilise the sooner the war will be over. In any case the Expeditionary Force could not be supported, except by reserves to replace casualties, till four months from the outbreak of war. It might, perhaps, be more accurately described, not as the advanced guard of the nation, but as its rearguard: to be sacrificed to allow the nation time to arm.

APPENDIX A.

(a) *The Wastage of an Infantry Division in the last War.*

In July, 1914, the estimated population of the United Kingdom was just under 46,332,000, of which 22,485,000 were males. Of this number approximately 9,344,000 were between 15 and 45 years of age, or 20 per cent. of the total population.

The total number of enlistments from all sources from the outbreak of war till the Armistice was 4,970,902 or 53 per cent. of the total male population of military age. Of the remaining $4\frac{1}{2}$ millions rather more than $2\frac{1}{2}$ millions were men in reserved occupations as shown in the National Service Register dated 31st October, 1918. These figures include the whole of the United Kingdom. But the total number of enlistments in Ireland only amounted to 134,202, whereas had the National Service Act been enforced there enlistments should have numbered about 523,000—a difference of 389,000. Of men of military age, a total number of 1,423,240 remains unaccounted for. It is fair to suppose that these were medically unfit.

From these figures we conclude that out of every 100 men of military age 57 were enlisted in one capacity or another, 28 were exempted from military service on account of their occupation, and 15 were medically unfit.

According to *Whitaker's Almanac*, on the 11th November, 1918, the strength of the Navy was 436,000; of the Army, 3,996,000; of the Air Force, 293,000. This shows that out of every 100 men enlisted 9 were required for the Navy, 85 for the Army, and 6 for the Air Force. The conclusion to be drawn from the above statistics is that from a total population of 46,332,000 the maximum strength available for the Army should be 4,467,604 men. As a matter of fact, owing to the Irish deficit, and casualties, this figure was never reached.

The maximum strength of the Army was reached in March, 1918, and amounted to 3,858,756 men. This number, owing to the desperate situation at that time included a number of boys and men who would not normally have been called up, but the crisis ensured that all available resources had been tapped. A few months later the position had become stabilised, temporary measures of meeting the emergency were no longer in force, and the number of men serving could be regarded as the normal. For these reasons it is proposed to examine the figures for 1st November, 1918. On that date the total estimated strength of the Imperial Forces was 5,336,943, not including the Volunteers, who numbered 248,444, nor prisoners-of-war, who numbered about 150,000. Of this army, 3,563,466 were British.

Of the British 2,075,275 were with the Expeditionary Forces, 1,383,311 were at home, 93,670 were in India and Burma, and 11,201 formed the garrisons of Defended Ports.

In the British Expeditionary Forces there were three Mounted Divisions and 63 Infantry. Taking the Cavalry Divisions as approximately of the same

strength as Infantry Divisions, we find that for every Division overseas there were 31,443 men in the theatre of war. At the same time units were below establishment to the total extent of 409,890 men, or an average of 6,404 per division.

These calculations show us that in round numbers 38,000 men are required for each division in the field.

On the same date, 1st November, 1918, there were at home 1,383,311 men, of whom 804,176 were trained. Not all these trained men were available for drafting; 24,673 officers and 443,034 men of different categories were so available, 37,021 officers were unfit for General Service, and 878,583 men were either not trained, Expeditionary Force men temporarily unfit, or men awaiting discharge. Of this last figure 312,785 were either awaiting discharge or would not be fit for General Service within six months. These men can be disregarded in our calculations.

In round figures the reserves at home amounted to about 1,000,000, or approximately one-half the strength of the Expeditionary Forces.

During the whole period of the war 8,975,954 men served in the field. The total number of "all-ranks days" was 3,169,030,499, which gives the average service in the field of each individual as 351 days, or 50 weeks.

In other words the number of casualties due to enemy action and sickness amounted to 8.7 per cent. a month.

Exhaustive figures showing the wastage from sickness are not available, but the number of sick evacuated from France for the year ending 28th April, 1918, averaged 23,400 a month, or 1.2 per cent. a month of the total strength. If we accept this figure as being approximately correct for all the theatres of war we get a monthly average of casualties due to enemy action of 7.5 per cent. Of such casualties 48 per cent. were permanent casualties—that is to say, killed—died of wounds or disease, missing, prisoners-of-war, died at home, and discharged medically unfit. The number of casualties returning to the ranks was 3.9 per cent. a month.

No figures are available to show the length of time these casualties were absent from their units, and we must accept the conclusion reached by Cron, of the Austrian Army, quoted in our Royal Army Medical Training, 1911: "Of the total casualties 10 per cent. will be so slightly wounded as not to require evacuation and may be retained in the Field Medical Units if the military situation permits, while 70 per cent. require hospital treatment. Of those requiring hospital treatment 70 per cent. will be suitable for Line of Communication medical units, while 30 per cent. require to be evacuated to home territory." If we apply this to our previous figure of 3.9, .75 per cent. will be so slightly wounded that they can be dealt with by the Field Medical Units, 2.295 can be cured in the theatre of war, and .94 will return to England for treatment.

No data is available from which to calculate the length of time spent in hospital, but we can assume that those cases treated in Field Medical Units will be back at duty in under a week; those in hospitals on the Lines of Communications will be absent a month; whereas those evacuated to England will not return in less than six months.

To apply this to each division going overseas, we must allow for a wastage of 1,402 a month, so that for each year of war about 16,824 new men will be needed to keep a division in the field at full strength.

Since the last war the greater part of Ireland has ceased to form part of the United Kingdom.

The total population on which to calculate the man power of the nation is now about 42,000,000. This gives us a total of 4,788,000 available for military service, and of these the Army would take 79 per cent., or a total of 3,782,520 men.

(b) *The Wastage of an Infantry Battalion in the last War.*

On the 11th November, 1918, in France, the Infantry formed 31·9 per cent. of the total force.

During the 4½ years of war they suffered 84 per cent. of the total number of casualties reported. This meant that the monthly wastage in the Infantry from battle casualties amounted to 20 per cent. of its strength a month. An additional 1·2 per cent. was due to sickness.

The War Establishment of an Infantry battalion was 891 men, and the above figures give us a monthly average wastage of 189. Of this number 109 returned to the ranks in one capacity or another. The permanent monthly wastage in the Infantry worked out at 80 men, or 8·9 per cent. per battalion.

[The figures on which these calculations are based are taken from "The Statistics of the Military Effort of the British Empire during the Great War 1914-1920," published by the War Office in March, 1922,—with the exception of the figures giving the relative strengths of the Navy, Army, and Air Force, which were taken from *Whitaker's Almanac*, and also the number of males of military age, which was taken from the Registrar General's report for 1914.

This report shows, for England and Wales:—

Age Group 15-20	...	...	...	...	1,695,568
" " 20-25	...	...	...	...	1,540,164
" " 25-35	...	...	...	...	2,903,146
" " 35-45	...	...	...	...	2,394,718

The distribution of the populations of Scotland and Ireland by age is not shown in the annual reports for that year, issued by the respective Registrars General and the number of males between the ages of 15 and 45 in those countries has been assumed to be in the same ratio to the total male population as in England and Wales.]

AN OUTLINE OF THE RUMANIAN CAMPAIGN, 1916-1918.

By MAJOR-GENERAL W. M. ST. G. KIRKE, C.B., C.M.G., D.S.O., *p.s.c.*

PART III

THE BATTLES FOR THE DEFENCE OF BUCHAREST AND THE RETREAT TO THE SERETH.

Events up to the 26th November. (Map 10.)

The Rumanian High Command, in consultation with General Berthelot,¹ had decided to use the General Reserve when concentrated near Pitesti in order to counter-attack the enemy, who had broken through the mountain barrier down the Jiu Valley, with a view to restoring the situation and relieving the Cerna Group. Two events prevented the execution of this plan, the first being the turning of the line of the Olt at Caracal by von Schmettow's Cavalry Corps; the second—and far more serious—being Mackensen's advance across the Danube further East.

As previously stated, the Austrian Danube bridging train had been sent to the vicinity of Sistovo prior to the commencement of hostilities. There it had lain hidden behind some islands in Bulgarian territorial waters for over three months, though its presence had become known to the Rumanians. It may be mentioned that this part of the river was particularly favourable for a crossing; in fact, it had been utilised for this purpose by the Russians in 1877 and again by the Rumanians themselves in 1913. From about the beginning of November, Mackensen's Danube Army, consisting of the 217th German Division, the 26th Turkish Division, the 1st and 12th Bulgarian Divisions, with a composite Cavalry Division (von der Goltz), had been concentrating. All preparations for the crossing had been carefully worked out, river gunboats and monitors had been collected, and it was only a question of waiting until Falkenhayn's Army was near enough to hold out a hand in order to set the whole plan in motion.

Movements of enemy troops towards the Danube had been reported to Rumanian Headquarters by French aviators, and also by a British air patrol from Lemnos; but it does not appear from the Rumanian dispositions that any precise information of that matter had been received by their intelligence service, for the 18th Rumanian Division on this front was split up by brigades from Oltenitza to Turnu Magurele,

¹ It was partly on his advice that the Cerna Group had been ordered to maintain its position after the defeat of Targu Jiu—an unfortunate decision.

a front of some 90 miles, whilst the reserve, consisting of the 2nd Cavalry Division, was near Bucharest. It must also be mentioned that this same 18th Division was composed very largely of elderly men most indifferently armed—even according to Rumanian standards—and equipped with obsolete artillery. Moreover, the Austro-Bulgarian river fleet had complete local command on the water. In these circumstances the crossing of the Danube by Mackensen's Army presented no great military difficulties and affords no criterion of the possibilities of the defence of a river line under modern conditions where close watch from the air can be kept on the enemy's movements on the far side of the obstacle.

The crossing was preceded on the 22nd by bombardments at various points from Giurgevo as far as the confluence of the Olt, where a few infantry were put across. On the 23rd, favoured by a thick morning mist, the real crossing commenced in boats, barges and launches. A covering force was soon landed practically unopposed. As visibility increased, powerful artillery fire from the water and from the southern bank broke up any Rumanian attempts at resistance, and by 3 o'clock Zimnicea had been taken by the 217th Division and a special covering force. By next morning a strong bridgehead had been formed to cover the construction of the heavy bridge and this was completed by the evening of the 25th, a praiseworthy engineering performance, as it involved a length of 1,000 yards. The main body then began to cross, the cavalry advancing towards Alexandria, the 217th Division towards Toporu; whilst the two Bulgarian divisions kept closer to the Danube, their right flank protected by the flotilla.

On the evening of the 26th the situation was as shown on Map 10, when von Schmettow's Cavalry had gained touch with the Rumanians at Rosi de Vede. The German advanced guard was approaching Draganesci on the main road to Bucharest; the 217th Division was to the south-east of the cavalry; on their right again came the two Bulgarian divisions; whilst the 26th Turkish Division was following the cavalry, standing some distance back. Meanwhile Giurgevo was being heavily bombarded from the south bank of the river. The Rumanian 18th Division and 2nd Cavalry Division had endeavoured to hold up the advance on the line of the Teleorman, but their flank had been turned by von der Goltz's cavalry higher up the river. They were now holding Draganesci, threatened by von Schmettow, von der Goltz and the 217th Division. It was quite obvious that, without reinforcements, the Rumanian forces opposing Mackensen's Danube Army (Kosch) would be quite unequal to the task.

On the same evening, 26th November, von Schmettow's two cavalry divisions and the 109th Division of Kuhne's Group, Ninth Army, were well across the Olt; the 11th Bavarian Division was following them, but the remaining two divisions, the 41st and 301st, were delayed by broken bridges and were only just beginning to cross the river. The 115th Division was still a day's march west of the river. Half

Kuhne's Group was, therefore, temporarily out of action. Sixty miles further north, von Dellmensingen's group, now $3\frac{1}{2}$ divisions strong, was only just beginning to emerge from the mountains at Curtea d'Arges; whilst Morgen, with two divisions, was still held up in front of Campulung. Morgen, von Dellmensingen and Kuhne were thus out of co-operating distance with each other, though the last-named's cavalry had established connection with the Danube Army (Kosch).

Leaving the Germans, let us now look at the situation from the Rumanian standpoint. When General Presan, the successful Commander of the Fourth Rumanian Army, arrived at G.H.Q. on 21st April, whither he had been summoned to re-establish the Western Rumanian front, he was presented with the aforementioned plan for a counter-offensive across the Olt, and accordingly he proceeded to Pitesti, where the available reserves were being concentrated. On the 23rd, however, news of Mackensen's crossing of the Danube was received, and G.H.Q.'s plan was, accordingly, thrown into the melting pot to be re-cast to meet the new situation.

The position of Mackensen's Danube Army was pregnant with possibilities. It was within two long days' marches of Bucharest, whereas the First Rumanian Army and the left flank of the Second Army wanted at least six days to extricate themselves from the mountains. For the evacuation of wounded, stores and *impedimenta* generally, only the Pitesti-Bucharest line was available; and, as can be seen from the panorama map, the lines of retreat of the Rumanian forces round Rimnik Valcea, Curtea d'Arges and Campulung all led towards Bucharest. If Mackensen were allowed to occupy the latter city, a disaster of the first magnitude would surely overtake the Rumanians. Obviously, he must be stopped, and the best chance of doing so effectively was to attack him.

As will be seen from Map 10, Mackensen's group, if not in the air, was certainly somewhat far advanced, and there existed a bare possibility that it might be crushed before any considerable portion of the Ninth German Army could intervene effectively. Part of this latter army was, in fact, advancing very slowly, and two days' delay had already been gained owing to the destruction of the bridges at Slatina and Dragasani. The German columns further north were still separated by mountain ridges and, consequently, it might be possible to beat the enemy in detail, whilst still spread out on a front of over 150 miles, on the lines so ably demonstrated by Falkenhayn in Transylvania.

A start must obviously be made with Mackensen's group. The defeat of this latter might at best paralyse the whole German strategy, just as the battle of Cibu had terminated the Rumanian offensive. At the worst, it was the surest method of gaining the time required to withdraw the First and Second Armies to Bucharest. It was true that time was not available to concentrate the necessary striking force before launching the attack, and it would be necessary to concentrate its elements on the actual field of battle. This course would entail a very

accurate estimation of time and space as regards both the Rumanian and enemy movements.

General Presan's plan was, roughly, as follows:—

- (a) The First Army (14th, 8th, 1st/17th, 13th and 1st Cavalry Divisions) was to delay von Dellmensingen and the 30rst Division (4½ divisions), falling back gradually on to the line Tiganesti-Costesti.
- (b) On their right the Second Army was to cover the oil regions, Buzau-Ploesti-Targoviste.
- (c) In the South, Joncavescu's group, consisting of the 18th Division and some odd brigades, was to stop Mackensen's Danube Army.
- (d) The gap of 30 miles between these two groups would tend to diminish as the First and Second Armies fell back, and its security was entrusted to the 1st and 2nd Cavalry Divisions.
- (e) Under cover of this screen, a "mass of manœuvre," consisting of the 9th/19th, 21st, 2nd/5th¹ Divisions was to attack Mackensen's left flank from the north, whilst the Russians assailed his right.

The 7th and 10th Divisions would be available later in general reserve; the Russians were asked to send five divisions, and arrangements were actually made with General Belaiev, Russian *liaison* officer at G.H.Q., to move up the 30th and 40th Russian Divisions which were watching the Danube further east. The combined attack was timed to take place on the 30th November.

The success of this scheme, an operation on interior lines comparable to Napoleon's plan in the Waterloo campaign, depended on the following factors:—

- (1) The forces detailed to hold off the various groups of Falkenhayn's Army should be adequate for the purpose;
- (2) The striking force should be of sufficient offensive power to obtain a decision within the time gained by the holding force.

Unless these conditions were satisfied, there was an obvious danger that von Dellmensingen might advance and threaten the attacking force from the north, or that Kuhne might appear like Blucher on the flank of the Rumanian "mass of manœuvre."

If the forces detailed to hold up von Dellmensingen and Mackensen's Danube Group on the flanks might be considered adequate, the cavalry opposing Kuhne in the centre seems to have been decidedly weak for the purpose, especially as the 7th and 10th Divisions (infantry) were not yet ready to support them. The First Army was, however, told to watch its left flank, so the gap would tend to diminish as the

¹ Not included in the first plan.

retirement proceeded; more was apparently expected of the Rumanian Cavalry—or less of the German Cavalry—than was actually realised. Nor was the composition of the “mass of manœuvre” such as to inspire any great confidence. The 2nd/5th Division, formed from units which had fought in the Dobrudja, had been constantly marching and counter-marching. It had to be brought across from the First Army, a march of between 40 and 50 miles. The 9th/19th Division, moreover, formed from troops which had been involved in defeats in the Dobrudja, was further weakened by the withdrawal of one brigade to Joncavescu's group. The 21st Division from the Predeal Pass, now near Bucharest, was strong, but became prematurely engaged in extricating Joncavescu's group and stopping Mackensen. The 2nd Cavalry Division south-east of Bucharest was fairly fresh.

The “mass of manœuvre” did not present the appearance of a strong team, but unfortunately it was the best obtainable.

EVENTS FROM 27TH-30TH NOVEMBER LEADING UP TO THE BATTLE OF THE ARGES OR NEAJLOV. (Map 10.)

To continue the story. Whilst the Rumanians were organising their “mass of manœuvre,” Kosch's Danube Army had been steadily advancing. On the afternoon of the 27th, the advanced guard of the 217th Division struck across from Toporul on to the main road at Prunaru, thus cutting the line of retreat of the Rumanians holding Draganesci. Part of the Rumanian 21st Division was sent south to eject the enemy, and the village was taken and retaken, victory finally resting with the Germans when their heavy artillery got up. In this action they took 700 prisoners and 20 guns, and badly mauled the already exhausted 18th Division. The 21st Division had, therefore, to be employed frontally to hold the German advance instead of waiting to strike its flank. Of the other units of the “mass of manœuvre,” the 9th/19th Division was coming forward through Coleasca on the 28th, and von der Goltz's cavalry, finding itself between its left and the right of the 21st Division, had to retire hurriedly. On the 29th again the German cavalry was in difficulties from the same cause. Curiously enough, this does not seem to have given the Danube Army any inkling of the Rumanian plan, for on the 30th (Map 11) its advance was continued towards Bucharest, and the crossings of the Neajlov were forced by the three leading divisions, the 26th Turkish Division following on the main Alexandria-Bucharest road, with von der Goltz close in, covering the left flank and out of touch with Kuhne's Cavalry.

In the meantime, Kuhne's group had not been idle. Covered by a number of small cavalry columns consisting of cavalry, one or two guns and some infantry in lorries, it pushed forward practically unopposed, and the advanced guards of the three centre divisions—11th Bavarian, 109th and 41st—had with the 6th and 7th Cavalry Divisions reached the positions shown on Map 11 by the evening of the 30th. Some inconvenience had been caused to the advanced guards by the passage

across their front of the 2nd/5th Rumanian Division, marching from near Costesti towards Draganesci; and on the 30th the 6th German Cavalry Division had a fairly serious collision with the same division, being driven back on to the 11th Bavarian Division. The advanced guard of this latter was also roughly handled, losing artillery, machine guns and transport. That the Rumanian movement should have been carried out so far with success is only less remarkable than that it should have occasioned no special concern to Kuhne. Despite the unfortunate experiences of the 11th Bavarian Division, he appears to have thought that it was a question only of wandering detachments of Rumanians which had been effectually disposed of.

Thus on the evening of 30th November, *i.e.*, one day late, the "mass of manœuvre" had reached its appointed area of deployment some ten miles north of, and parallel to, the Draganesci-Balaria road. On the right stood the 2nd/5th Division, with its left on Flamanda; next the 9th/19th, with its left on Clejani; then the 21st Division astride the main road north of the Neajlov, and lastly the 2nd Cavalry Division behind the 2nd/5th Division.

We thus get the almost Gilbertian situation shown on Map 11 which discloses a crescendo of enveloping attacks. The German 217th Division was now preparing to push forward to Mihailesti in an endeavour to turn the Rumanian flank on the Arges, while the Rumanian "mass of manœuvre" was about to strike the 217th Division's flank; meanwhile Kuhne's three divisions and two cavalry divisions was advancing, almost unopposed, into the gap between the First Rumanian Army in the north and the rear of the "mass of manœuvre," quite unconscious of any danger threatening Mackensen. As a matter of fact during all this time low clouds, mist and rain made conditions extremely unfavourable for air reconnaissance. Those who maintain that in future nothing can be hid from the air forget that there is such a thing as winter. To complete the picture, one must add that the long-deferred Russian offensive in Northern Transylvania, designed to cut the communications of all the enemy forces operating against Rumania, had at last started on 28th November. It resulted in bitter fighting, some small gains, the withdrawal of one and a half Austrian divisions from Transylvania. Then it gradually petered out, as the Russian divisions were necessarily withdrawn to stem the *débâcle* in Rumania.

On the front of the First Army von Dellmensingen had advanced up to the Rumanian selected position, Tiganesti-Costesti, while a flank column, pushing eastward, had threatened the rear of the Rumanians holding the Campulung Basin and forced them to retire, thus releasing Morgen's group from its long imprisonment in the mountains.

1st December. (Map 12.)

In accordance with the optimistic orders issued on the evening of 30th November, both Mackensen's Danube Army and Kuhne's group continued their advance at an early hour. The "mass of manœuvre"

had now cleared the latter's front, and the German columns met with little opposition from the Rumanian cavalry. But things went very differently with the Danube Army. The German 217th Division commenced by making good progress against the 21st Rumanian Division, when at 10 a.m. its Commander, von Gallwitz, received warning from von der Goltz's cavalry that strong Rumanian forces (9th/19th Division) were advancing from the north. A weak flank-guard was thrown out hastily to join hands with von der Goltz's cavalry which was falling back on Ghimpati, and the heavy artillery, which had run out of ammunition, together with all *impedimenta*, were cleared back to Pingalesti.

Further back the 26th Turkish Division began to form front towards the threatened flank to meet the attack of the 2nd/5th Rumanian Division. The latter took Tarnava and claimed to have routed the Turkish Division, which from later events seems to have been a grave overestimate of the actual success gained. In any case the Turks were still holding Draganesci on the main line of communication, when a fateful order reached the Rumanian General Sodec, commanding the 2nd/5th Division. This order, sent also to the 9th/19th Division, was to the effect that he was to direct his advance so as to assist the 21st Division, which had been driven back from its appointed position and was in danger of defeat.

The result of this order is plainly seen on Map 12. The 2nd/5th Division stopped its operations against the Turks and counter-marched. The 2nd Cavalry Division, whose duty it was to protect the exposed flank of the 2nd/5th Division, conformed and, after doing nothing all day, eventually took up its position behind the infantry. Thus the 26th Turkish Division was given complete freedom of action, as was also the German Cavalry.

Meanwhile, the 9th/19th Division, advancing in two columns towards the front Ghimpati-Balaria, was also drawn off to its left owing to the enemy's success against the right of the 21st Division at Mihalesci. However, in an attack at 10 p.m., it captured Balaria, and so cut the main line of communication between the bulk of the 217th Division north of the Neajlov and von der Goltz's cavalry and the 26th Turkish Division south of that river. Communication between the 217th Division and the Bulgarians on their right was also partially interrupted by the 21st Rumanian Division, which had pushed a column forward from the Arges. Further to the south-east the Russian 40th Division was coming into action against the extreme Bulgarian right. Thus, strategically, the requisite combination of all available forces on the battlefield had apparently been effected satisfactorily by the Rumanian Command, but the tactical execution was hardly up to the same standard. All three divisions of the "mass of manœuvre" were converging on the weak 217th Division, which was acting like the cheese in a mouse trap. They were tending to become congested in a comparatively small area, whilst leaving to the enemy comparative freedom of action to form a larger circle round them.

During the night, the 217th Division evacuated its forward positions and concentrated to the rear towards Banesci, a movement which was interpreted by the Rumanians as a presage of victory. But if the local situation may have appeared satisfactory to the Rumanians, the general picture certainly gave no cause for congratulation. The nearest formation of Kuhne's group (11th Bavarian Division) was only one day's march away near Coleasca; two more divisions, the 115th and 109th, were within two days' march, whilst the German cavalry could, if necessary, reach the battlefield. Moreover, 1st December had been a bad day for the First Army in the north, from which the 14th Division emerged only some 1,400 strong, whilst the combined 13th/14th Division could only muster 5,000 combatants. The 1st/17th had, indeed, held up the 301st German Division, which was trying to turn the southern flank, but the whole of the First Army was in retreat towards Gaesti.¹ Part of the scanty general reserve, the 10th Division, had to be called upon to check the enemy's advance and to gain time for the "mass of manoeuvre" to complete its task.

The orders issued by the Rumanian Command to the "mass of manoeuvre" on the night 1st-2nd December, were to the following effect:—

- (i) The 21st and 9th/19th Divisions were to pursue the enemy in a south-easterly direction, so as to drive them into the arms of the Russians who were to form the other arm of the pincers.
- (ii) The 7th Division was to cover the operation by holding a position facing north-west between the Arges and Neajlov.
- (iii) Similarly, the 2nd/5th Division was to take up a position astride the main road through Ghimpati facing south-west, and the 2nd Cavalry Division was to fill the gap facing west.

Had these orders been carried out, subsequent events would have taken a different course; but, unfortunately, communication with the 2nd/5th Division was interrupted by the small active German cavalry columns, and the order never reached General Sodec, who apparently was left with the dominant idea that he was to march to the help of the 21st Division.

Let us now look at the situation from Falkenhayn's point of view. On the 30th November his Army, the Ninth, had passed from the command of the Archduke Joseph, who had succeeded the Archduke Charles, to that of Mackensen. Early on 1st December, the latter informed Falkenhayn that he intended to seize Bucharest. As neither Bulgarian nor Turkish troops were suitable for the purpose, he directed Falkenhayn to send the 11th Bavarian and 115th Divisions to join the 217th Division, whilst the 109th Division was to approach Bucharest from the west and north-west. Falkenhayn replied that the 11th Bavarian

¹ It was in consequence of these moves that the Rumanian staff officers carrying an important order, referred to later, drove into the arms of the advancing enemy.

Division was in action and the 115th not yet arrived. This conveys a strange impression of the German intelligence service, and more particularly so in view of their unchallenged air-superiority. It also shows that, excellent commander as Falkenhayn undoubtedly was, he was a distinctly trying subordinate. However, the situation was completely disclosed at 5 p.m. on the 1st by the purely fortuitous capture of a car containing two Rumanian staff officers bearing an order from the First Rumanian Army Headquarters to one of its divisions opposing von Dellmensingen, and forwarded by the latter to Falkenhayn.

The order ran as follows:—

"When the 'mass of manœuvre' is ready to-day, 30th November, it will commence its offensive towards Draganesci against the enemy forces which have crossed the Danube. The task of the First Army is to maintain its present positions and hold fast the enemy forces opposed to it. It is most important that its operations should be as aggressive as possible, so as to cause the enemy to employ his whole strength against it.

"Particular attention must be paid to the left flank. The Army Reserve at Gliganu, 10 kilometres east of Cotesti, is at the entire disposal of the Army. . . . On the battle which begins to-day depends the fate of our country. I ask every officer and man to die at his post. I remind all that no mercy will be shown to cowards. All such will be shot without regard to rank. . . ."

(Signed) Lt.-Colonel GOVONESCU, C.G.S.,
for General Stratulescu,
Comdg. 1st Army.

A more complete "give away" it would be hard to imagine, and there instantly springs to mind the military axiom that nothing should be contained in an order which it is not necessary for the recipient to know. Was it essential for the Northern Group to communicate to its troops the time and objective of the southern offensive? If so, was it necessary to commit the detail to writing, and could not it have been communicated equally well verbally?

The Germans now had a complete picture of the Rumanian plan from the most authentic source. To this misfortune has been attributed the Rumanian failure. This is undoubtedly going too far, though what actual difference the captured order made is less easy to estimate. Falkenhayn already knew that there were some enemy between his right and Mackensen's left. Writing after the event, he says that the fact did not disturb him, since by continuing to advance eastwards he was most likely to round up the opposition; he assumed, apparently, that the Danube Army would not, in the meantime, suffer defeat. Information received by the evening of 1st December would, however, have disclosed that the latter was being seriously attacked; and, since Falkenhayn was under Mackensen's command, he would eventually

have had to obey the latter's demands for assistance from Kuhne's group. Still, Falkenhayn was of an obstinate disposition and did not obey orders gladly, so it is quite possible that he would not have changed his instructions for 2nd December as quickly as he actually did. In that case the Rumanian "mass of manoeuvre" might have had another 12-24 hours in which to gain a decision. Whether that would have been sufficient the reader will judge for himself. If not, the Rumanian situation might have been actually worse, as Kuhne's group would have been further east and the direction of its attack more fatal.

This, however, is conjecture. The cold fact was that Falkenhayn, on the evening of 1st December, was basing his plans on a certainty such as seldom falls to the lot of a commander in war. He understood the difficult situation in which the Danube Army temporarily found itself, and the exposed position of the Rumanian forces attacking it. On the other hand, the Rumanian Northern Armies were obviously showing signs of giving way completely. It was a case of *embarras de richesses*.

To cut off the retreat of the Rumanian First Army, it was necessary for at least part of Kuhne's group to move to the north-east. To help Mackensen and cut off the southern group from Bucharest, it was equally obvious that Kuhne should advance to the south-east. To do both meant advancing in divergent directions. Falkenhayn's solution of the problem for 2nd December was to direct his northern division to the north-east towards Titu, with an independent mission to attack the left rear of the First Rumanian Army, whilst his two southern divisions (109th and 111th Bavarian) were to march south-east and to attack the Rumanian southern group in the rear. The Cavalry Corps was to cover the 30 miles gap in the centre and try to cut the Ploesti-Bucharest railway; the 115th Division and a Cyclist Brigade, 20 miles back, were to form the Army Reserve.

It would appear that, had the Rumanians at this juncture disposed of sufficient fresh divisions, Rumanian or Russian, and advanced into the gap, they would have been able to turn the tables by attacking in flank either of Kuhne's widely separated columns. Mackensen apparently feared some such danger, since he declined to agree to the 109th Division moving south-east; instead, he ordered Falkenhayn to keep it in the centre, where in the end it did nothing, thus greatly weakening the German counter-attack against the Rumanian southern group, and possibly saving them from a worse disaster than they actually suffered. His fears proved groundless for, in actual fact, the only Rumanian reserve available, the 7th Division, was hurried forward by battalions as it arrived to close gaps in the line between the First Army and the "mass of manoeuvre."

The 30th Russian Division was still detraining south of Bucharest, and its commander declined to put it in piecemeal; whilst other Russian formations, at last under orders for an area east of Bucharest, were only beginning to arrive in their usual leisurely fashion.

2nd December. (Map 13.)

During the night the German 217th Division managed to withdraw its forward detachments and concentrate round Banesci, the movement confirming the Rumanian view that they were in full retreat. The Rumanians early on the 3rd continued their attacks, and both the 9th/19th and 21st Divisions gained considerable successes, capturing prisoners and guns. Stilpu was taken at noon, and the 217th Division was practically surrounded. Unaware of G.H.Q.'s intentions, the 2nd/5th also pushed forward, converging on the 9th/19th and leaving its own rear completely unprotected. It may be added that only one Russian Division had shown any activity, and that arm of the pincers had failed to cause the Bulgarians¹ any very real anxiety.

Though the position of the German 217th Division north of the Neajlov was precarious, it had again absorbed the united energies of three Rumanian divisions. The latter had gained a purely local tactical success, quite incommensurate with the risks run to obtain it.

Meantime the 26th Turkish Division, with the main Draganesci-Balaria road at its disposal, had succeeded in deploying and in forming a front which threatened to overlap and outflank the right of the Rumanian "mass of manœuvre." The 11th Bavarian Division was in touch on their left in a still more threatening position. The efforts of the 2nd Rumanian Cavalry Division, which had tried to check them on the line of the Slavaciocul, had not appreciably delayed their advance, and von der Goltz had also again come forward.

The sands were running out.

Unless some more efficient protection than the 2nd Cavalry Division could be provided for the flank and rear of the entangled mass presented by the 21st, 9th/19th and 2nd/5th Rumanian Divisions, it was obvious that a disaster was inevitable. Fortune, too, was against them, for their communications were cut by the German cavalry, and neither orders nor ammunition could be got through to the 2nd/5th Division. In the meantime, in the north the First Rumanian Army had continued its retirement after another trying day, in which the 8th Division and the 13th/14th had again suffered heavily. The 10th Division had, however, successfully delayed the advance of the 41st German Division across the Arges towards Titu, and thus given time to the remainder of the 1st Army to fall back to a position to the west of that place.

The 109th German Division and 7th Cavalry Division had got a footing across the Arges and were in contact with portions of the 7th Rumanian Division. The 6th German Cavalry Division was near enough to co-operate with the 11th Bavarian Division.

The Rumanians were under the impression that there was only one Bulgarian Division present, which fact may partly account for their optimism at this stage.

3rd December. (Map 14.)

Unconscious of the actual position of affairs, the "mass of manoeuvre" continued its attacks on the morning of the 3rd. Considerable success crowned their efforts. Chirculesti was captured by the 21st Division; Joncavescu's group carried Singureni, while the 9th/19th gained ground towards Banesci. Further east the Russians made progress.

Meantime the storm had been gathering behind the Rumanians, and about 11 a.m. it broke. Unexpectedly attacked in rear, the 2nd/5th Division was seized with panic, broke through the 9th/19th Division and fled across the Arges. The 11th Bavarian Division, with the 6th Cavalry Division on its left, advanced against the 9th/19th from the west, the 26th Turkish Division from the south, whilst von der Goltz and the Landsturm joined in. The unfortunate Rumanian Division, tied up around Stilpu and Epuresti, continued to resist till nightfall, when the survivors made their way across the Arges. The 21st Division managed to retire in fairly good order, as did Joncavescu's group, the Russians on its left conforming.

The Danube Army was too exhausted to take up the pursuit, and according to Falkenhayn was also engaged in the more congenial task of collecting booty which really belonged to the 11th Bavarian Division. The 6th Cavalry Division, which had marched on the morning of the 3rd from a point ten miles to the north-west, was also held up by detachments of the 7th Division some distance short of Mihalesci bridge, which accounts for the escape of a portion of the 9th/19th Division.

Alone the 11th Bavarian Division was unable to force the Arges crossings on the 3rd.

Further north the 7th Rumanian Division delayed the 7th Cavalry Division and 109th Division; whilst, thanks to the stand made on the 2nd by the 10th Rumanian Division, Titu was only taken after the bulk of the First Army had fallen back east of the Titu-Targoviste railway, thus evading envelopment from the south. But all the Rumanian divisions had suffered very heavily, and those opposing Morgen not less so. Thus, when the Germans drove them out of Ploesti on the 6th December, the 22nd Division had only 1,000 combatants and the 12th not many more. The retreat of the 4th Division was intercepted and it surrendered at Mislea on the 7th December. Of the mass of manoeuvre, the 2nd/5th Division rallied only 150 infantry; the 9th/19th 4,000 out of 16,000 with which it went into battle. The 18th, 21st and 7th Divisions lost over 50 per cent. Thus the German claims of 20,000 prisoners and 100 guns were probably not exaggerated.

Before completing the melancholy story of 1916, a few supplementary remarks must be made on the Battle of the Arges. The Rumanian operation has been represented as a brilliant example of the use of interior lines, which only just failed to produce decisive results. It has even been compared to the Battle of the Marne, where the interposition of French and British forces between von Kluck and

von Bulow led to the retirement of the whole German front. The comparison will not bear examination, however, because at the Marne our flanks on either side of the gap were more than holding their own, which was not the case here. Marshal Foch's axiom that the front must be stabilised before a counter-attack is launched had not been observed.

Undoubtedly, the over-extension of the German forces between the 26th November and 30th November—14 divisions and 3 cavalry divisions on a front of about 180 miles—invited defeat in detail, had the Rumanians been in possession of the necessary means for the purpose and able to bring them to bear effectively within the time at their disposal. The possibility was so obvious and alluring to the Rumanian General Staff, that it tended to obscure the fact that without Russian assistance their means were inadequate for the purpose. Whether they received any definite promises of strong and timely Russian support is doubtful. In any case, limitations of transport made it tolerably certain that it could not arrive until the mass of manœuvre was fully committed on its desperate venture. The whole operation thus became a gamble of the first order; the fact that it started 24 hours late, and that the enemy by the capture of the fatal order looked over their cards, merely converted a probable failure into a certainty, since all the elements necessary for success were lacking.

The amputation of a limb of the German Armies was a delicate surgical operation requiring a far sharper instrument than the Rumanian Army.¹ Fresh, well-trained troops, adequately supplied with a powerful artillery, might have been able to crush in Mackensen's flank on 30th November and 1st December, and then have turned to meet Kuhne's attack on 3rd December. A few tanks to break up quickly the weak flank guard which held up the mass of manœuvre on 30th November might have been decisive. It would be a mistake to argue from this example that such an operation is doomed to failure. In future campaigns it may still be possible by surprise attacks of this nature to obtain a favourable decision quickly. If so, the operation on interior lines as practised by Napoleon may regain the pride of place from which the resisting power of small arm weapons has tended to oust it. In the present instance, the Germans were on perfectly safe ground, for, with the Rumanian Army as it was, there could be no real danger of its obtaining a tactical success quickly, if at all. When criticising Rumanian strategy, this unfortunate fact must be remembered, for no strategy can succeed against consistent tactical failure.

Though it arrived late, the "mass of manœuvre" marched well enough to the battlefield—particularly the 2nd/5th Division—but its subsequent tactical performances were lamentable. The whole Rumanian

¹ For instance the 2nd/5th Division, a day or two before it marched south, had been issued with new French machine guns, which the men did not understand and for which ammunition was lacking. They were thrown away early in the battle.

plan was based on the capacity of the 21st Division to hold its ground on 1st December. Its failure to do so led to an unfortunate change in the direction of the attack, to which fact may be largely ascribed the subsequent disaster, aggravated by neglect of elementary military precautions for security on the part of the 2nd/5th Division. The cavalry throughout compared unfavourably with the German cavalry opposing them. The Russian co-operation was slow and half-hearted. But, whilst in such circumstances it is not difficult to show that the Rumanian plan had no great chance of success, it is far more difficult to suggest any alternative which could have proved more effective in saving Bucharest or been equally successful in achieving the partial extrication of the First and Second Armies. Had the 2nd/5th Division received the order to act as a defensive flank on 2nd December, the "mass of manoeuvre" might well have been withdrawn without suffering disaster, after achieving a limited tactical success. The alternative plan, favoured by the Russians amongst others, was to remain on the defensive, preferably but not necessarily so as to cover the capital, and there to await the German attack or the Russian counter-offensive in Transylvania, whichever came first. That the latter would ever affect the situation was very doubtful, and, if the Rumanians could not hold disjointed attacks against prepared positions in the mountains, what chance had they against the Germans, when the latter were concentrated and able to develop the full force of their overwhelming artillery? The Rumanians themselves believed that the Germans had none! Their situation may be compared to that of the Germans on the Western Front after 8th August. The Command had lost confidence in the troops, and the troops in themselves. A tactical success was the best—probably the only chance—of regaining both. Acting defensively, the best the Rumanians might have hoped for, in view of the leg-weariness of the Germans, would have been to hold the line of the Jalomita, if indeed the Russians could have been induced to fight so far forward. The slowness of the latter, due largely to faulty communications, had spoilt every plan as soon as it was made and rendered the task of the Rumanian High Command extremely difficult, if not impossible. In practice, the arrangement by which all Russian troops in Rumania came under Rumanian command worked far from well. The situation went from bad to worse as, contrary to the original estimate on which the military convention was based, the numbers of Russian troops had to be continually increased. Such difficulties are inevitable in the case of allies; the Germans also were by no means free from them. But they are apt to assume larger proportions when things are going wrong.

The effective use made by the Germans of their strong cavalry during the preliminary phases in the favourable conditions which obtained will have been noted. The successes of their small mixed columns, which, appearing and disappearing like will-o'-the-wisps, bewildered the heavier and slower-moving Rumanian columns, were marked. The

Germans, however, failed to get full value from their cavalry in exploiting the victory of the Arges.

But perhaps the most remarkable feature of the Rumanian Campaign of 1916 was the influence of the German heavy artillery. At Turtukai, during the battles in the Dobrudja, at Cibiù (Hermannstadt), Brasov, Kronstadt and Targu Jiu, it was the force of the heavy artillery which decided the issue. The desperate Rumanian venture on the Arges was partly caused by their fear of the effect of the heavy guns in the plains. On the Western Front the troops had learnt to dig themselves in before the heavy artillery reached any big development. In the moving battles of the Rumanian Campaign, we get perhaps a better picture of the effect of heavy shell in open warfare, a lesson which is apt to be forgotten in peace time. Moreover, the development of mechanical transport makes it tolerably certain that in any future war on a large scale the employment of heavy artillery is likely to increase.

The remainder of the story can be quickly told. On 3rd December it was decided to evacuate Bucharest and to declare it an open and independent town—a wise conclusion. Its occupation became a race between Falkenhayn and Mackensen, which the former claims to have won by a short head.

For the Rumanian Army there could be no further question of offensive action; the whole front was swinging backwards on the firm pivot provided by the Ninth Russian Army on the Moldavian crest of the Transylvanian Alps. Moreover, the vexed question of the command as between Russians and Rumanians was now settled by Brussilov taking over the whole front to the Black Sea. The Rumanian theatre thus became in name and fact what strategically it should always have been, viz., a portion of the Russian front. Since the Russians did not possess the means, even if they had the desire, to embark on an offensive in Rumania, they fell back on the only sound strategic alternative, viz., to shorten the front as much as possible and to cover with the minimum of troops the reorganisation of the Rumanian Army which, rightly or wrongly, they held to be an unreliable instrument and incapable of further efforts. That this policy met with the most violent opposition from Rumania need hardly be mentioned, since it involved giving up to the enemy all but a small corner of that country. It has been represented as the crowning act of a calculated course of treachery; and, unfortunately, the Russian side of the story is never likely to be represented authoritatively.

In conformity with this policy, preparations were made by the Russians for gradually taking over the whole front. As a first step, they brought up a Cavalry Corps to maintain connection between the Russian IVth Corps, which had been fighting south of Bucharest, and the VIIIth Corps concentrating north-east of that town. Incidentally, the orders for these movements fell into the hands of the Germans.

The latter were directed to pursue with the utmost energy, but performance fell considerably short of the expectations of the Higher

Command. The reasons for this were not far to seek. Kuhne's group, for instance, had been marching and fighting continuously for 26 days and had covered over 200 miles. The men were in rags and their boots worn out. The Cavalry Corps was in no better condition, the shoes dropping off the horses. Under the heavy traffic, the roads became quagmires; supply trains could not get up owing to broken bridges; the bridging trains themselves were far behind. In addition, the Russian and Rumanian rear-guards, fighting by day and retiring by night, inflicted considerable loss on the advancing columns which could with difficulty deploy off the roads. Consequently, the Germans succeeded in cutting off no considerable formation with the exception of the 4th Rumanian Division. In this fashion, sufficient time was gained to rob the enemy of some of the fruits of victory. The oil wells were destroyed or damaged; enormous stores of corn were burnt; arsenals were dismantled or blown up, and factories of military value rendered useless. In addition, the 1917-1920 classes were evacuated, with 30,000 interned enemy subjects, as well as large numbers of civilians, the total being estimated at over 1½ millions. The actual retreat was carried out in the most painful conditions. The two single lines of railways were blocked by the Russian reinforcements constantly arriving. The roads, encumbered by every kind of transport, presented the same pitiful pictures of flying inhabitants as were witnessed in Belgium and France in August and September, 1914, with this addition that it was winter and the weather at its worst.

For some time the German High Command appear to have cherished ideas of effecting a minor Tannenberg by smashing the pivot on which the retreat was being conducted and cutting in across Northern Moldavia. With this object, on 18th December the First Austrian Army with 11 divisions was directed to push forward through the Ghimes and Oituz Passes and get behind the Russians, who had organised a position west of the Sereth (Map 14), whilst Falkenhayn attacked them from the south-west and in the direction Rimnicul Sarat-Focsani. The operation resolved itself into a straightforward attack on a 50-mile front, somewhat on the lines of a battle on the Western Front, and it is not proposed to describe it in detail. The salient features were that, owing to the slow advance of Falkenhayn's Army, the battle (Rimnicul Sarat) only commenced on 22nd December.

By means of the Alpine Corps and two other German divisions, an effort was made to drive in the Russo-Rumanian right in the mountains, in conjunction with the Austrian First Army, but little progress was made. Mackensen, further South on the right, did nothing to help; and it was only after four days' hard fighting that the Russians were ordered to retire to a second prepared position covering Focsani, their right still resting securely on the mountains to the north, but leaving 10,000 prisoners in the enemy's hands.

In reporting the battle to G.H.Q., Falkenhayn thought it necessary to include the following remark: "So long as it was only a question

of overcoming Rumanian resistance on the Sereth, we could count on the reasonable probability of reaching and crossing it before the depth of winter. The arrival of strong Russian forces has changed this. It seems possible that the army will be frost-bound before it reaches the river, *i.e.*, before it has broken through the Russian bridgehead, and certainly before it can cross it. The consequences as regards supply, communications, fuel, etc., in this exceptionally poor country, which has been systematically devastated by the Russians, need not be pointed out. The troops in bivouac have already suffered severely." He then asked for clear instructions as to what the objective of the Army really was. He observed that, whilst G.H.Q. apparently wanted him to push north-east in co-operation with the First Austrian Army, Mackensen was continually ordering him to detach troops south-east to help his own operations towards Braila which were going none too well. G.H.Q. replied that the intention was to take Focsani first, and then decide further action. There was no intention, however, of advancing beyond the Sereth—a statement of policy which Falkenhayn describes as "oracular."

Preparations were, however, made to attack the second Russian position or bridgehead, and the battle of Focsani opened on 3rd January. It partook of much the same nature as the previous battle. The operations of the two first days caused heavy losses with no advantage gained. Falkenhayn viewed the situation with considerable misgivings. Discipline in the Army was weakening; stragglers, plundering and looting, filled the towns and villages behind. Typhus and cholera had made their appearance. All his Corps Commanders were of opinion that their men had had more than enough. Only one fresh division remained in reserve, and it looked like a bad ending to the victorious campaign of the Ninth Army. However, G.H.Q. had already announced to the world that Focsani would shortly be captured, and there was no choice but to go on.

On the 5th some success was gained, but this was offset by a Russian counter-attack which made a big bulge in the German centre and captured some heavy artillery. To Falkenhayn the situation looked serious, and he had actually issued orders for the withdrawal from the line of two divisions to attack the flanks of the salient after the Cambrai model, when a Russian order sent out by wireless was intercepted and deciphered. By these means, it was ascertained that the successful Russian attack was not intended to break the line, but rather a local effort to re-establish the bridgehead; it had only advanced so far owing to the unexpected retirement of the Austrian brigade opposed to it. Previous orders were at once cancelled, and divisions were re-grouped on the 6th for a continuation of the main offensive, assisted by a snow-storm which precluded any possibility of a Russian attack.

On the 7th considerable success was gained, the Russians falling back beyond Focsani and retiring across the Sereth and Putna. Further north, however, the Austrians made no progress, and the general strategic

situation was not materially altered. G.H.Q. optimistic as ever, now requested Falkenhayn to force the Putna in order to command the railway junction at Maracesti; but the Russian strategy of retirement, until the enemy was too tired to follow, was once again to prove effective. The Ninth German Army had been fighting and marching for three months, and in so doing had, in Falkenhayn's opinion, reached or even passed the limit of human endurance in open warfare. He therefore replied that his troops were exhausted and that the weather precluded further campaigning; he would, therefore, try and reach the line of the Putna and Sereth, which seemed the best defensive position, and there dig in. This was effected without further fighting, and so closed the first year of the campaign.

Remnants of the Rumanian Army had taken their share in the battles of the retreat, but as a fighting force it practically ceased to exist. For instance, after the Arges one weak division could alone be formed from the three divisions of the mass of manoeuvre. Of the original 600,000 comprising the Field Army, only about 200,000 remained. Eighty thousand were prisoners in the hands of the enemy; over 150,000 were dead, or wounded and missing; 150,000 more were wandering about or trying to find their units. From the 200,000 survivors, five divisions were formed, which took their places in the line; the remainder went into cantonments, to form the nucleus for the new Rumanian Army which was to rise like a phoenix from the ashes of the old.

The retirement from Wallachia also entailed the evacuation of the Dobrudja, and by the end of the year the last Russian troops had crossed the Danube. Herded together in the small north-eastern corner of Moldavia were now very large numbers of Russian troops, over a million refugees, and the *débris* of the Rumanian Army. Typhus became rampant; then, as the enormous influx from outside ate up the resources, famine followed.

The Rumanian Army lost during the winter 1916-17 more than 100,000 men, a large proportion of whom belonged to the young classes now being incorporated. Mortality amongst the civilians was appalling.

On the other side of the front, conditions were equally cruel for the Rumanians. The badly-fed prisoners in the hands of the enemy died off in thousands; the civilian population was decimated. Even the Ninth German Army, living in the best conditions obtainable, lost in one cold snap effectives equal to more than one-quarter of its previous battle casualties.

Such were the conditions in which the reconstitution of the Rumanian Army was undertaken. Munitions were poured into the country by the Allies, and, with the devoted assistance of a strong French Mission under General Berthelot, a new Army of 15 divisions, admirably equipped and animated by the highest spirit, was ready by the spring. The Central Powers were thus foiled in their object of eliminating Rumania.

Here we must leave the Rumanian Campaign. Space does not

permit of more than a reference to the glorious battles of Marasti and Maracesti, in July and August, 1917.

The Bolshevik Revolution in November, 1917, completed the disintegration of the Russian forces in Rumania. It was followed by a declaration of war by the Soviet Republic on 26th January, 1918, which led to Rumania having to fight against enemies on every side. At the end of March, 1918, she was forced to make a preliminary peace with the Central Powers,¹ which was finally ratified in May. But Rumania was again to take up arms early in November in a last and successful effort to secure her territorial war aims.

In comparison with the population, the Rumanian losses from 1916-19 were very large, dead alone being 2,330 officers, 217,516 other ranks, including 169 officers and 70,335 other ranks who died as prisoners in enemy hands. If to the above be added the victims of plague, pestilence and famine, the total loss of Rumanian life has been put at 800,000,² or more than 10 per cent. of the population.

Before closing this summary, let us try to strike a balance of profit and loss caused by the intervention of Rumania on the side of the Allies. The Central Powers had gained moral and political advantages, and a much-needed fillip had been given to their national *morale* after the defeats of Verdun, the Somme, the Trentino, the Isonzo, and in Galicia. In a military sense, communication with Turkey down the Danube had been opened; while materially the Central Powers had acquired grain and oil, though not so much as they had expected. On the other hand, it is quite possible that Germany would, in any event, have carried out an offensive in the Balkan theatre, and in view of the difficulties of maintaining any large forces on the Salonika front, it is probable that this offensive would have taken the form of an attack on Rumania. Falkenhayn states quite frankly that the advantages of invading Rumania had been considered as far back as the spring of 1915, and again in the autumn of that year.³ Obviously, if carried out at Germany's selected time, greater results would have been obtained with far less effort.

As it was, the campaign strained the German resources very considerably; the losses, which fell mainly upon German troops, were far from negligible even in 1916,⁴ and heavier losses were still to come before Rumania was eliminated from the war. The invasion inflicted hardships on Rumania, probably surpassing those suffered by any other of the combatants, with the exception of Serbia, but they were not all loss from the general standpoint of the Allies, and in the long run proved to be the birth pangs of the "Greater Rumania" of to-day.

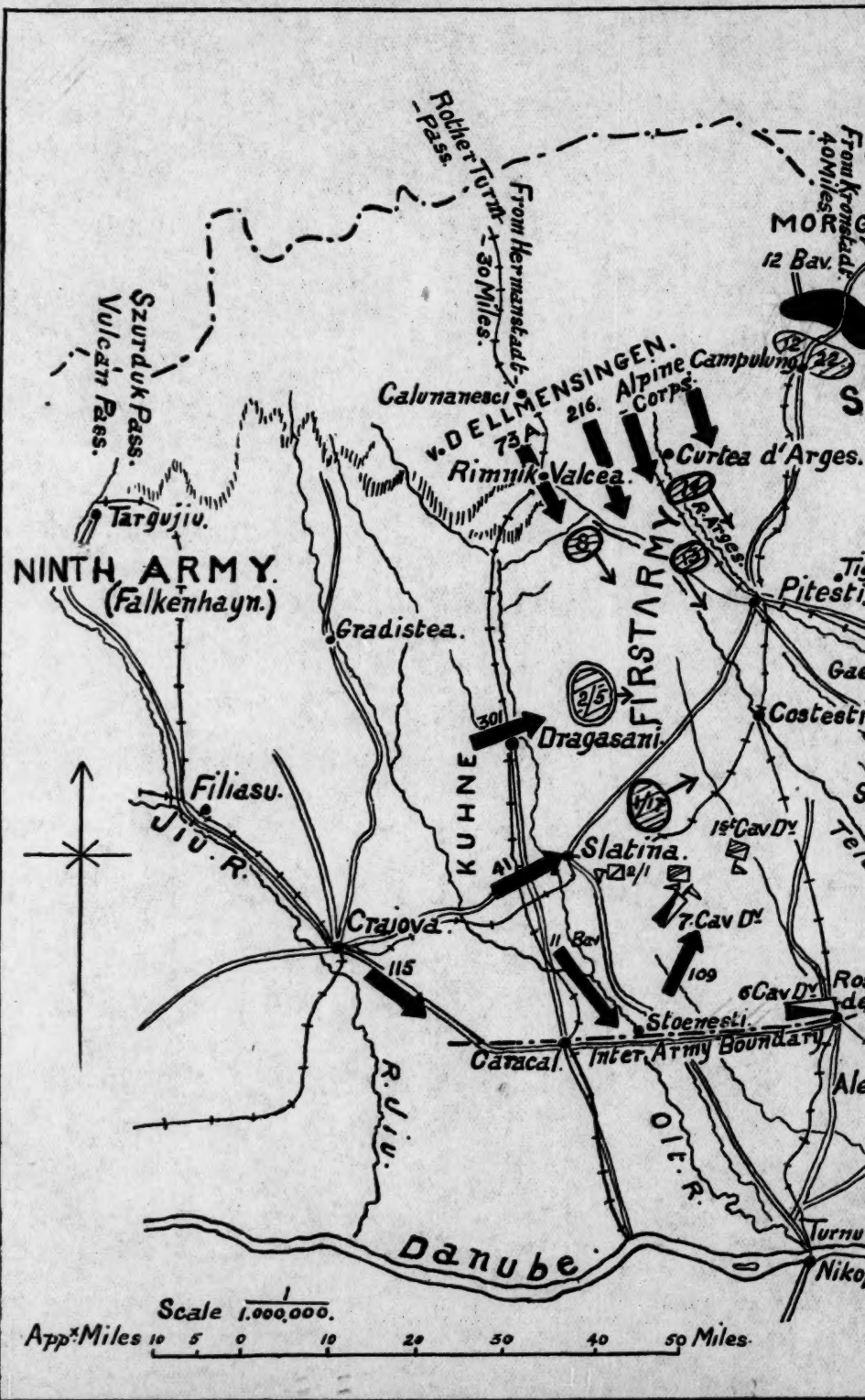
(Finis.)

¹ An armistice with Germany was made on 16th December, 1917.

² "Istoria Războiului." Vol. II., page 644.

³ "General Headquarters, 1914-16, and its critical decisions," pp. 203, 204.

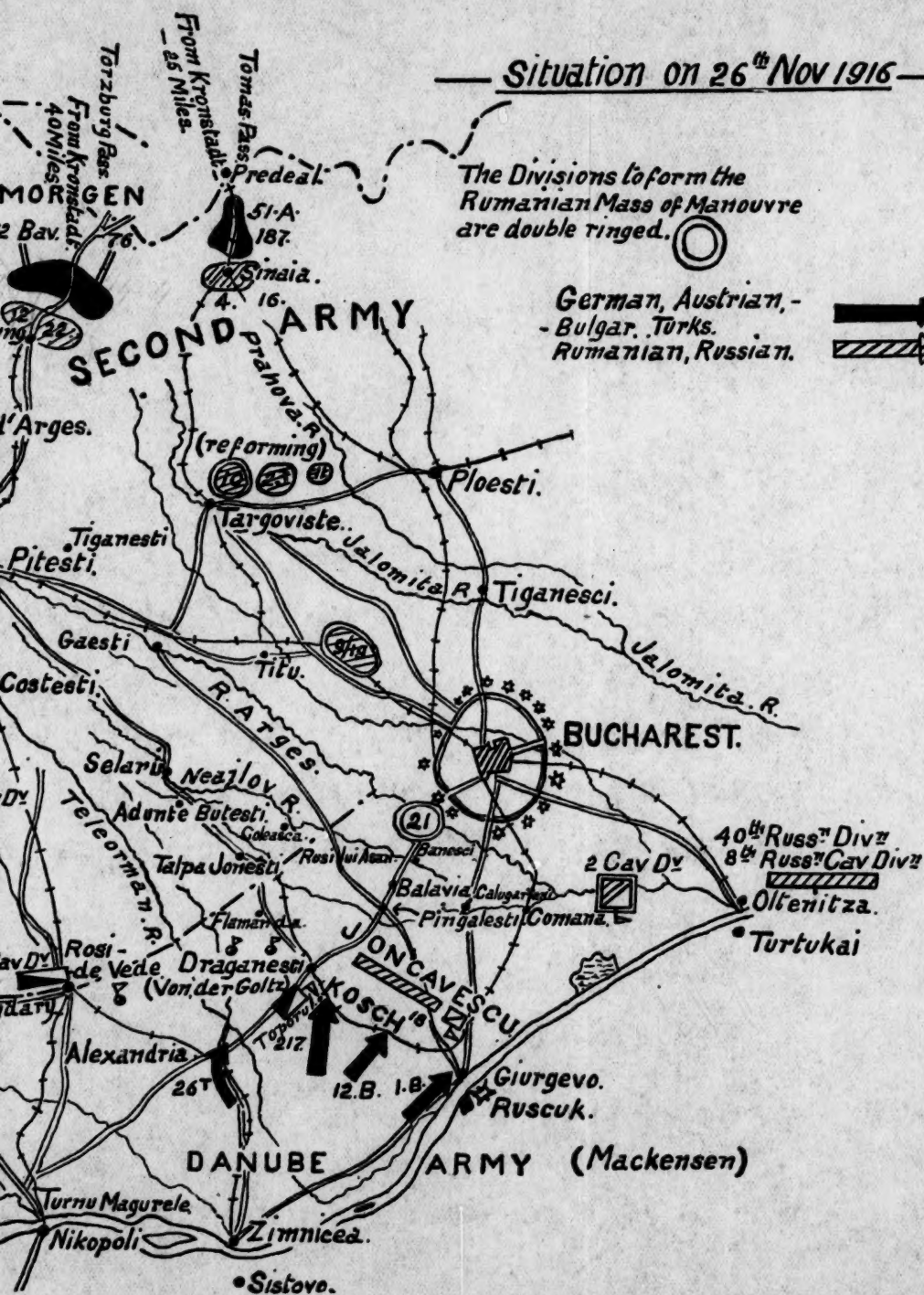
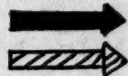
⁴ The Germans themselves are unable to say what they actually were.

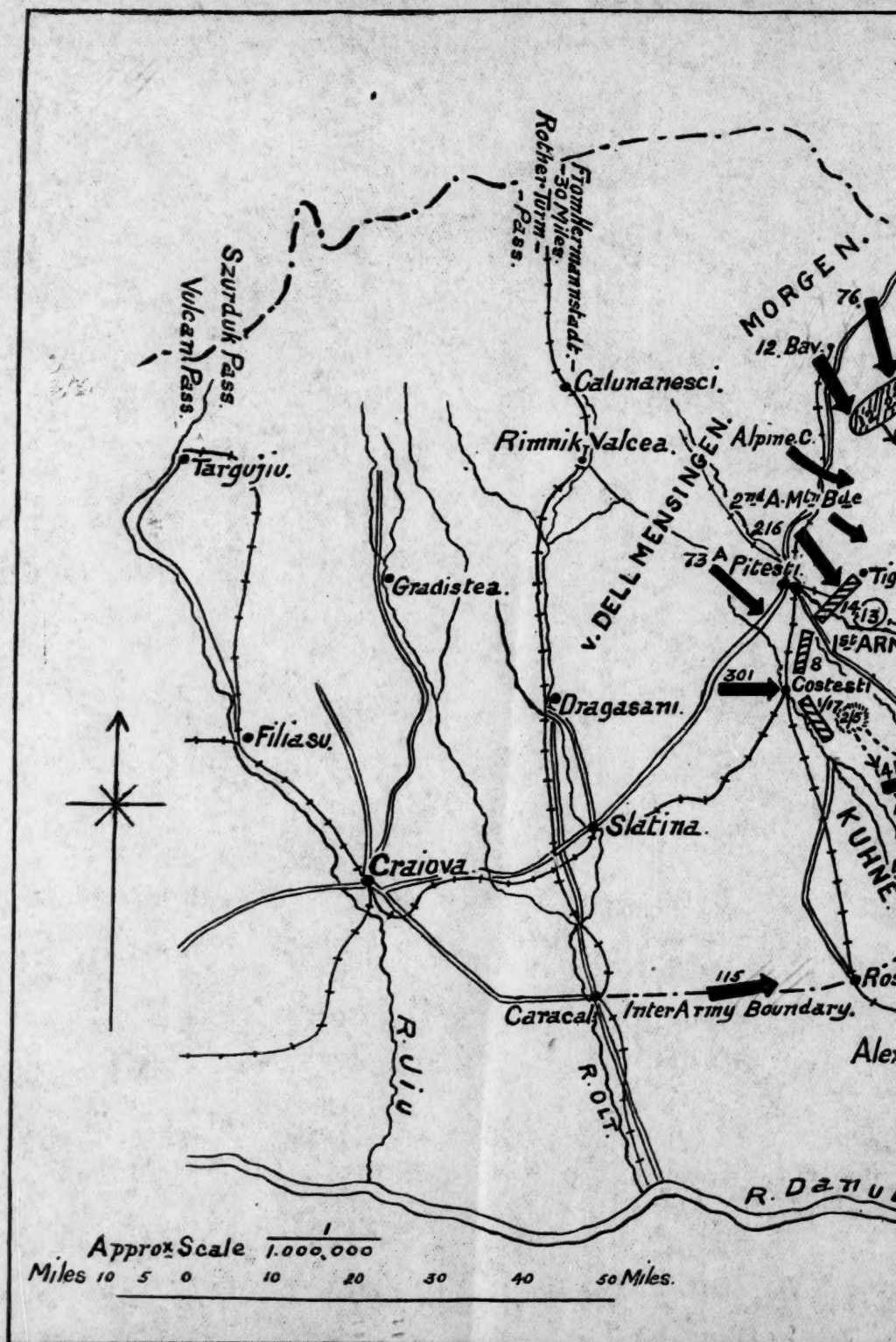


Situation on 26th Nov 1916.

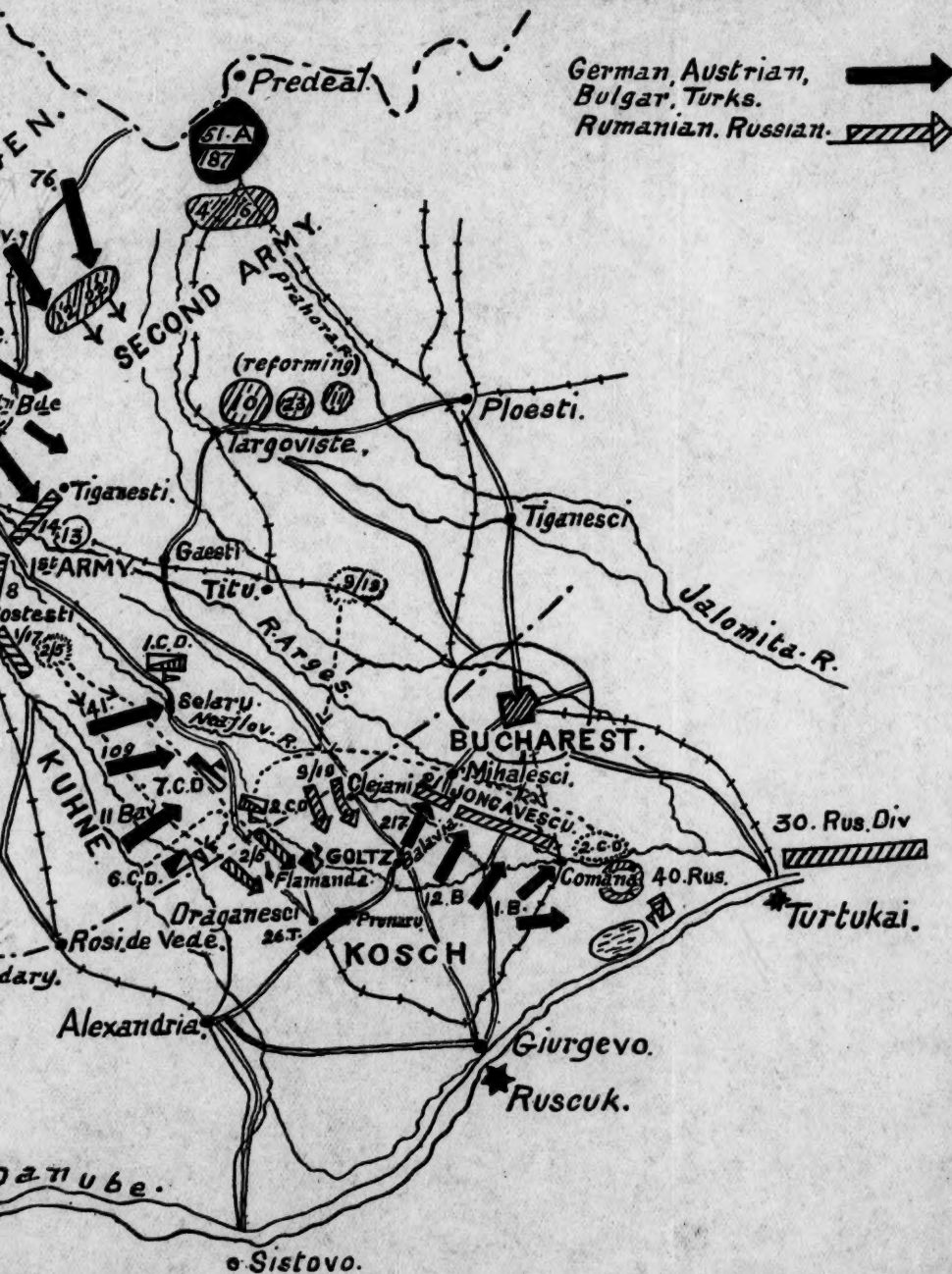
*The Divisions to form the
Rumanian Mass of Manoeuvre
are double ringed.*

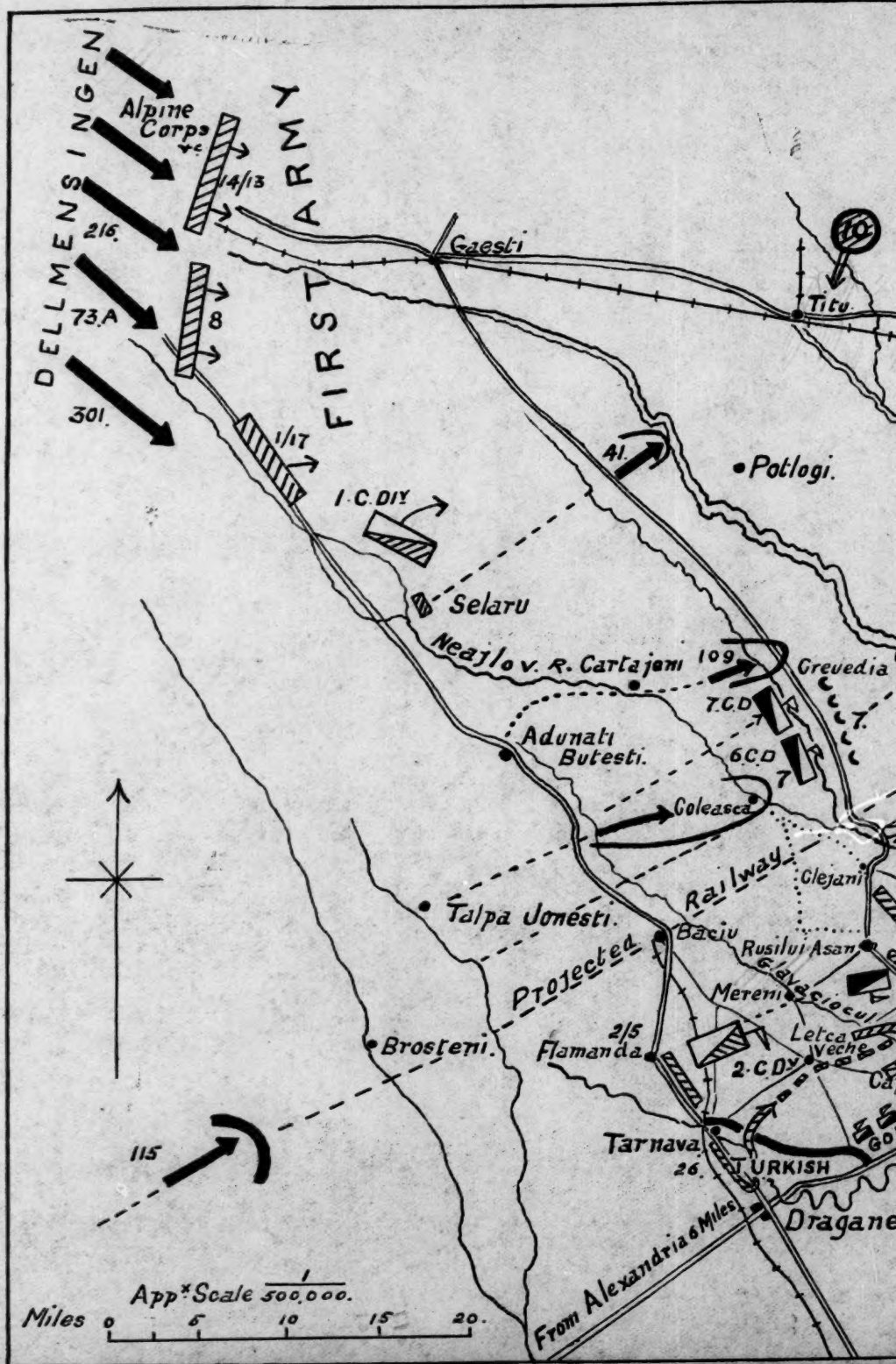
*German, Austrian, -
- Bulgar. Turks.
Rumanian, Russian.*





Situation on Evening of 30th NOV 1916

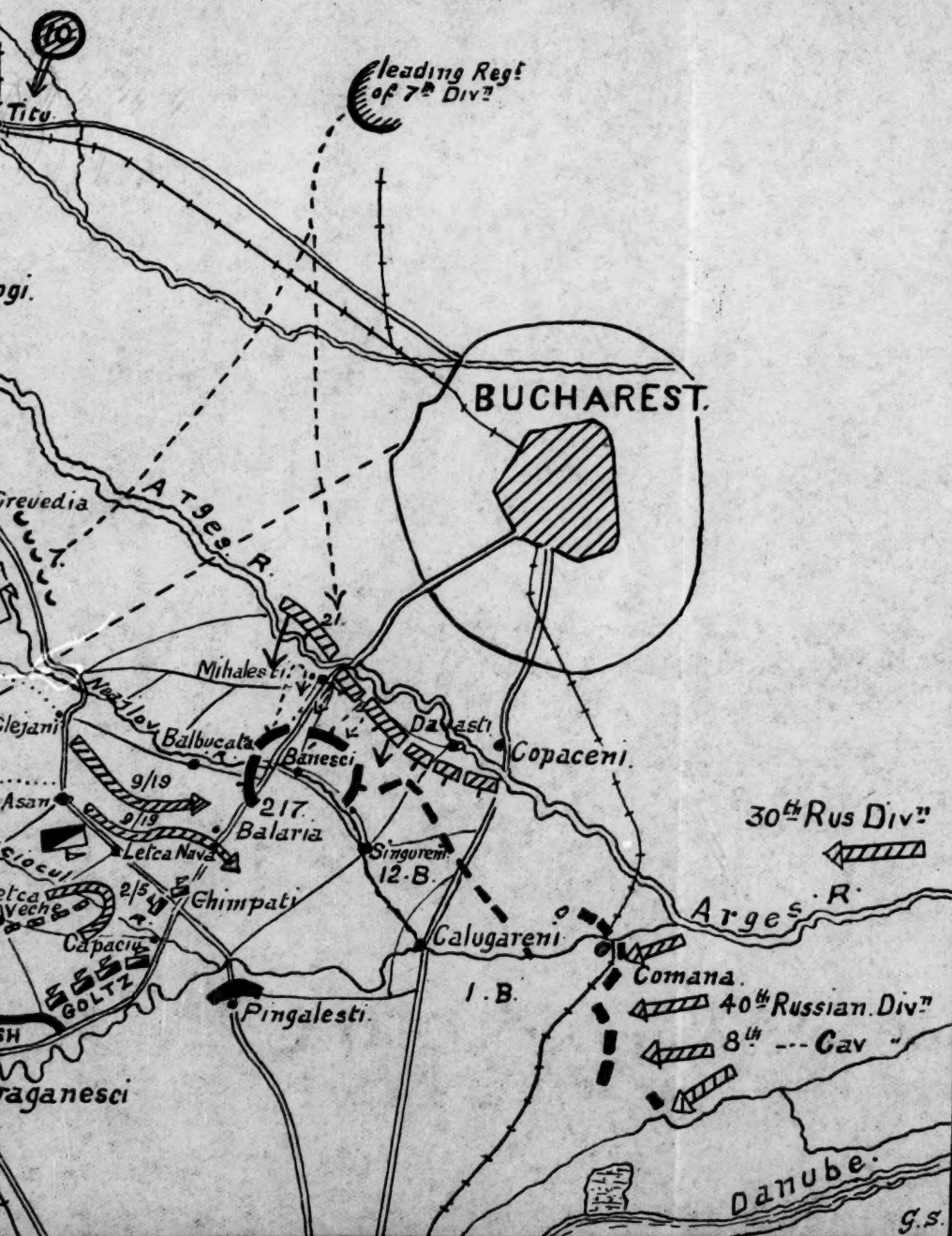
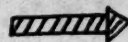
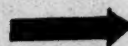


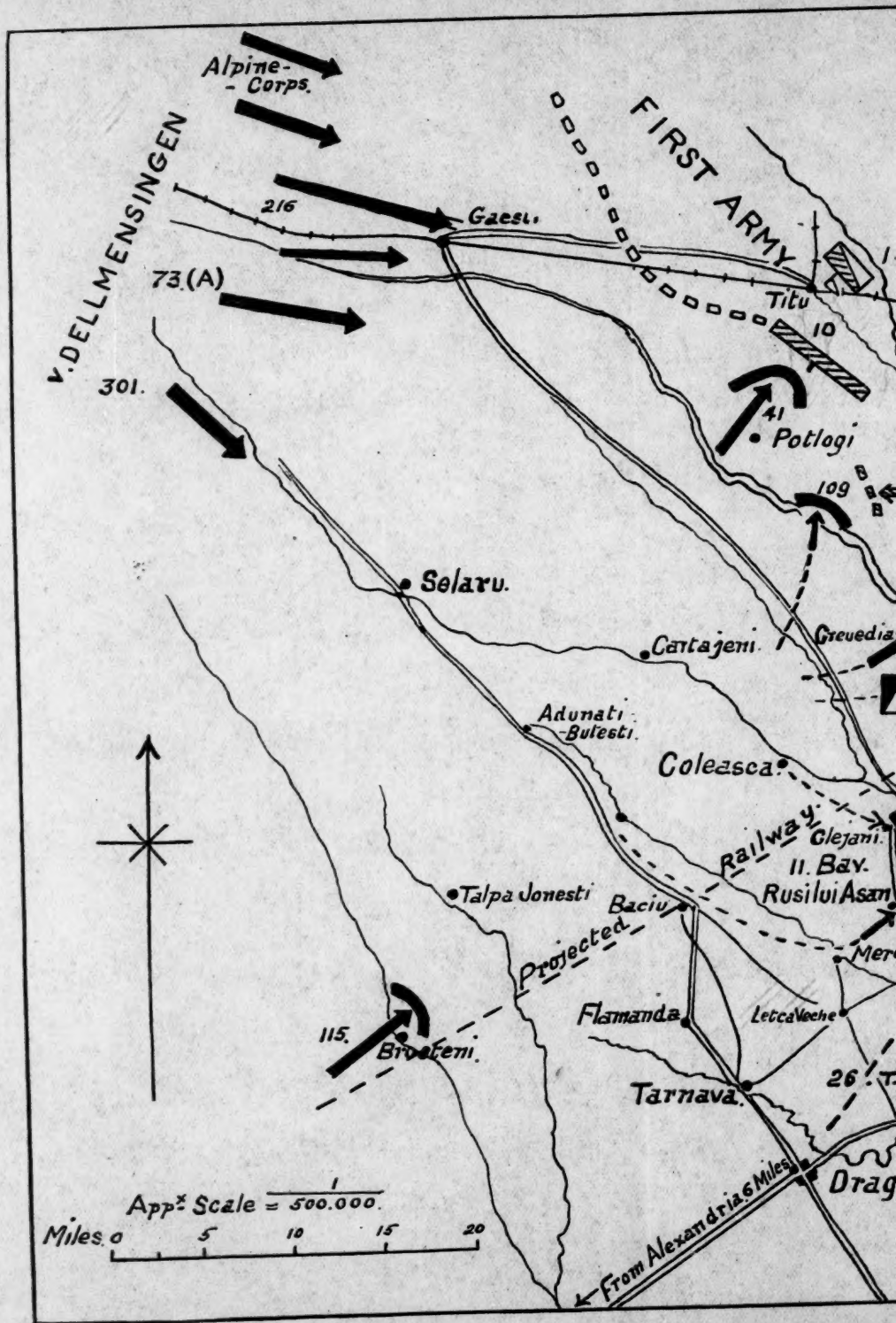


Situation on evening of 1st Dec 1916.

German, Austrian, Bulgar, Turks.

Rumanian, Russian.

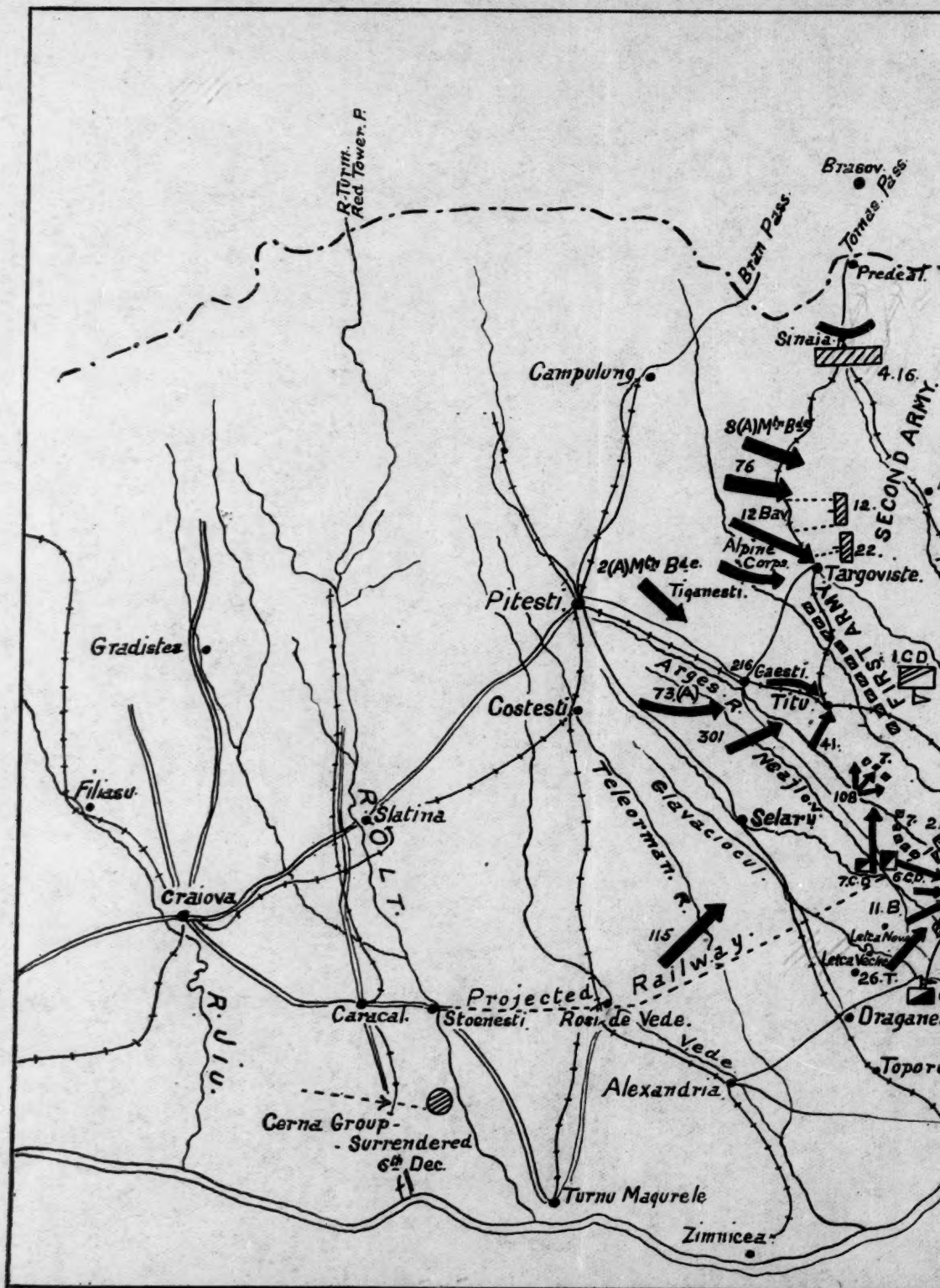


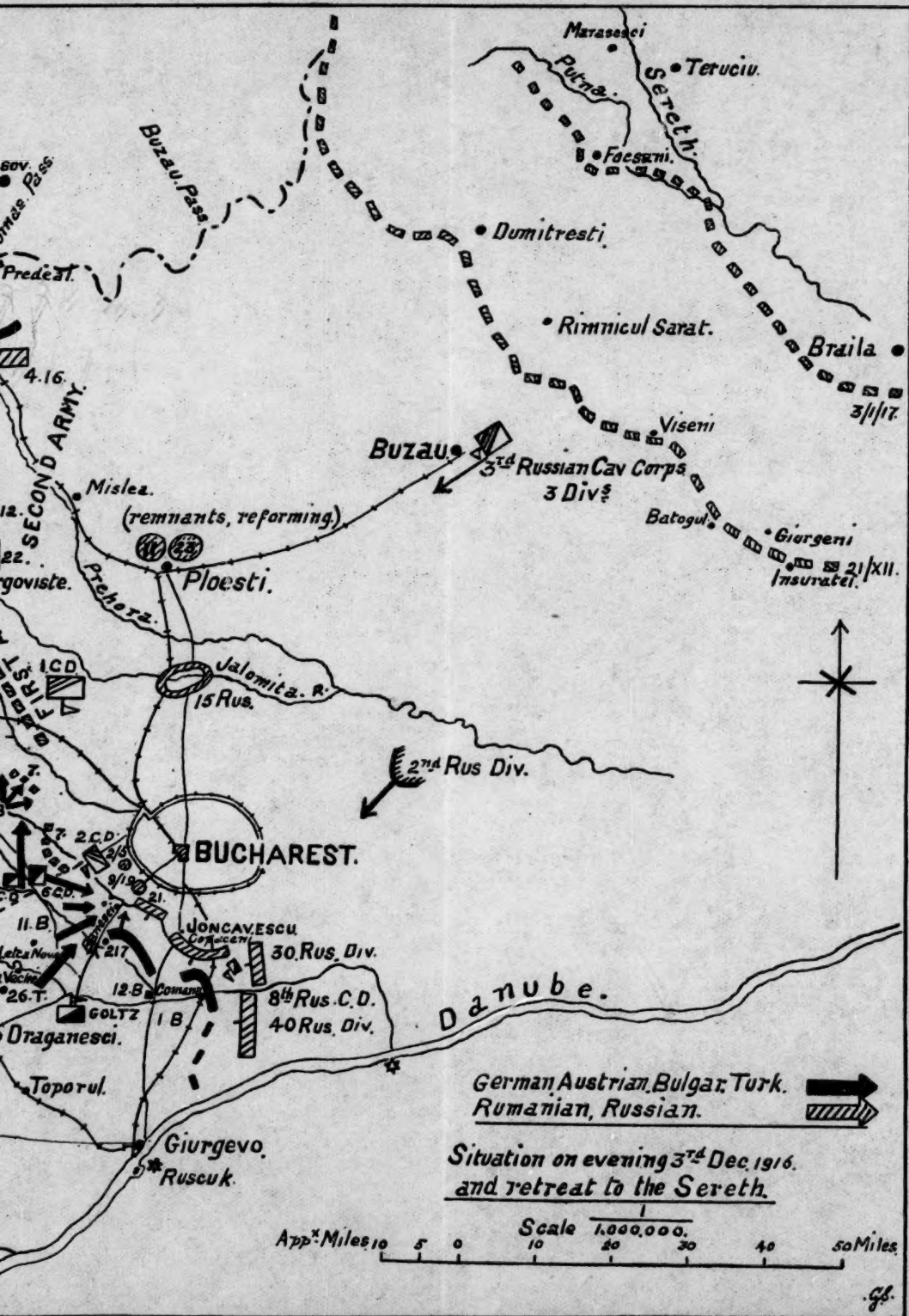


Positions on the evening of 2nd Dec 1916.

German, Austrian, Bulgar-
-Turks.
Rumanian, Russian.







THE FRENCH ARMY.

By CAPTAIN G. L. HARRISON, D.S.O., The Queen's Royal Regiment.
(Instructor in English, École Spéciale Militaire, St. Cyr.)

On Wednesday, 17th December, 1924, at 3 p.m.

ADMIRAL SIR REGINALD G. O. TUPPER, G.B.E., K.C.B.,
C.V.O. (Chairman of the Council), in the Chair.

THE CHAIRMAN: My lords, ladies and gentlemen, I regret to have to tell you that the Earl of Derby, who was to have presided this afternoon, has sent the following telegram: "Am very sorry to have been unavoidably prevented from attending lecture this afternoon. Would you express my regret and apologies to Captain Harrison.—DERBY." As Lord Derby is unable to attend, the Secretary at very short notice has asked me, as Chairman of the Council, to take the Chair at this important lecture. Being a sailor, I feel that it ought to be the privilege of a general officer of the Army to occupy this distinguished position to-day. I hope you will excuse an Admiral being here instead of a General, but we have had very short notice of Lord Derby's inability to attend and have been unable to get another Chairman.

I now have the great pleasure of introducing to you Captain G. L. Harrison, D.S.O.

LECTURE.

I.

SIR REGINALD TUPPER, my lords, ladies, and gentlemen, when the Council did me the honour to ask me to give a lecture on the French Army, it appeared to me that on account of the wide field of the subject and the consequent difficulty of treatment, I should try to talk on general lines and avoid detail as far as possible. Figures and statistics are to a certain extent unavoidable, and I shall not trouble you with many.

What I have done is to select one or two of the more interesting and important aspects of the army as it is to-day and I shall confine myself to commenting upon them.

In the first place, what are the present relations existing between the army and the nation?

Secondly, in what ways has the service been affected by the war?

Thirdly, what points of interest are there in the present system of training and what are the objects in view?

Before dealing with the first point, it may be worth while to remind you of the distinction between the Metropolitan and Colonial armies, as I only intend to deal with the former in this lecture.

Metropolitan Army.—The Metropolitan Army consists (i) of all white troops serving in Europe, except such as are allotted to the Colonial Army Corps stationed in France; (ii) of native troops in North Africa; and (iii) of the Foreign Legion. Of the Divisions in France, 20 are normal strength and 12 known as *renforcées*; that is, with considerably increased effectives. Of these 12, nine are mixed divisions; that is, their brigades consist of two native and one white regiment.

As regards the North African troops, it is worth noting that while service in Tunis is compulsory, recruiting in Algeria and Morocco is in principle carried out by enlisted and re-enlisted men.

Colonial Army.—The Colonial Army in principle consists only of Infantry and Artillery, and its *rôle* is the occupation and defence of the Colonies. It is made up of natives of the Colonies (other than North Africa) and the Colonial Corps stationed in France, which helps to form the mixed divisions. These natives comprise troops from Senegal, French Equatorial Africa, Madagascar, Indo-China, French Somaliland and the Pacific Islands. The Colonial Army has its own *régime*, its own budget for that part of it which is serving in the Colonies, and its own administration services.

Recruiting is in principle carried out by enlistment and re-enlistment. The conditions are much the same as for the Infantry of the Metropolitan Army. Creoles may be attached to the Colonial Army and Frenchmen may serve in it at their own request. If numbers fail, ordinary French conscripts may be sent to the Colonial troops, but only with their own consent and for service in the Mediterranean basin.

The Colonial Corps stationed in France is administered separately by the Director of Colonial troops at the War Office in *liaison* with the Ministry for the Colonies.

The Army and the Nation.—Speaking generally, it may be said that, though conscription is still as hateful to the Frenchman as ever it was, he is more or less resigned to some form of it, as far reduced as possible. The feeling as regards Germany, the Mediterranean basin and the colonies may be stated very briefly.

Germany.—The attitude of France and her army towards Germany has not changed since the war. The old enemy still remains the chief menace and the present dispositions of the army have been made with a view to countering any stroke of revenge which may be initiated in the future.

It should be realised, then, that the army is, as it has been since 1870, a covering force against attack from the East. This force consists now of 32 divisions, 6 of which are on the Rhine, with 6 in support, and the remaining 20 disposed in the interior of the country. Under cover of this

defensive force the general mobilisation would take place and the nation would prepare for war.

North Africa and the Colonies.—One is sometimes led to think by articles in the daily press and elsewhere on colonial development that the French are eager for expansion of their Colonial Empire in North Africa if not elsewhere. It would not be, however, too much to say that public opinion is really hostile to any development which would entail a military offensive. They are quite ready for their African colonies and others to be exploited by peaceful penetration, but aggressive military action would certainly be regarded with disfavour.

Morocco.—The reduction of troops, on the contrary, is not unwelcome. and, though reduction in Morocco is not at present contemplated owing to the Spanish war in the Riff and other temporary local conditions, Marshal Lyautey has pledged himself that it will take place. I am speaking, of course, of French troops (of which there are in Morocco 20,000 out of a total force of 64,000 odd). The increase of native troops, however, has been considerable since 1918.

By the end of next year the General Staff expect to have about 330,000 men available, made up as follows:—

North Africa	125,000
French West Africa	100,000
Indo-China	85,000
Madagascar	20,000
Somalis	2,000

Syria.—As far as the mandate in Syria is concerned, it is proposed to reduce the force to 14,000 French troops from the beginning of 1925. General Gouraud has stated that it is not advisable to have more than one-fifth native levies out of the whole force in Syria, which means that the troops there will not exceed 20,000, all told, next year.

Changes in Army System.—A distinction should be drawn between the national army of 1914 and the present idea of the nation in arms, a nation which can be mobilised behind its active army covering force. Such a mobilisation would entail the exploitation of all the national resources so as to produce the maximum of offensive and defensive weapons.

The new army laws were framed with a view to maintaining the conditions secured by the Treaty of Versailles and this is the present aim of all military effort in France.

Régions Territoriales.—It was found that as technical troops increased owing to the evolution of modern war, the organisation of army corps in territorial regions became very difficult. It was realised that in a future war there would have to be an economical mobilisation of the whole people, industrial, commercial and agricultural.

In 1921, therefore, the old territorial organisation and that of formations of the army (that is, divisions and non-divisional formations) were

made independent of each other. The non-divisional formations are the *réserves générales*—M.G. battalions, tanks, cavalry (5 light divisions), artillery, aviation, etc.

Of the 21 military regions created in 1873 there are now 20. These are no longer called only military but also regions of national mobilisation.

The regional commander is responsible for the preparation of economic and industrial mobilisation, recruiting and administration of reserves, gendarmerie, etc., but the army is grouped in formations.

This allows the divisions etc. to be altered and commanded independently of regional organisation. The importance of this for training and war is obvious. But for economy's sake, in peace time the General Officer commanding a *corps d'armée* also commands the region in which his H.Q. is situated. He exercises supervision over the administration services as regards general discipline, health, accommodation and preparation for mobilisation, for all the troops in his region and also commands the divisions and non-divisional formations, who are under their own commanders for training, interior economy, etc. In war the active army will consist of these divisions and non-divisional formations increased as far as the resources of the 18 youngest classes permit, and would be grouped as corps, armies, and groups of armies. The former system of one corps for one region does not hold good in all cases.

While the corps go off to war, the regional organisation and a different regional commander appointed to take over the region from the corps commander on the outbreak of hostilities, remain to carry on the work of mobilisation. The regional commander in war would probably be a general of reserve, who has become more or less acquainted with his duties in peace time.

Mobilised Nation.—In war, then, there is no reserve, properly speaking, but a mass of mobilised troops and material at the immediate disposal of the Commander-in-Chief.

"The army in peace time," in the words of a well-known authority, "must play the part of an instructional establishment for the armed nation and consequently function as a vast school for producing reservists instructed in all their military duties and ready to carry out their particular rôle in time of war."

The so-called 2nd reserve, or last 10 classes, consisting of men over 40, the former territorials, are to be used in the mobilisation of industries, factories, agriculture, etc.

Reduced Service Law—Calling-up.—One of the most serious difficulties due to the present 18 months' service is that each class is called up in two parts. In most units, therefore, the officers are forced to repeat the wearisome recruit training twice a year. Units are composed of men of different standards of knowledge, which makes it difficult to do useful training. Matters would doubtless be improved if there were special battalions in each regiment, analogous to our *depôt* system, where six months' recruit instruction could be carried out. This would separate

men fit for mobilisation from recruits under instruction and would undoubtedly improve the training conditions for the former.

N.C.Os.—Again there is the N.C.O. difficulty.

The recruiting law was framed on a basis of 100,000 professional soldiers, of which 75,000 were to belong to the Metropolitan and 25,000 to the Colonial Army. This gives a total for the War Budget (Metropolitan Army) of 89,000. Now, as the effectives budgeted for under this heading in the 1925 Budget amount to 88,000 odd, of which 53,000 are to be N.C.Os., it is evident that the desired total is not far from being reached. Nevertheless each year the number of professional N.C.Os. becomes harder to maintain. Reforms in their treatment are slow in materialising and there has been much dissatisfaction in their ranks. Moreover most of the old N.C.Os. were promoted or killed in the war, or else preferred civil life when it was over, and 18 months scarcely suffices for efficient training of new ones.

The only solution is the re-enlisted man and until his lot is made more attractive, the prospect of continuing to obtain the necessary complement is not too bright. Still, certain reforms and increased rates of pay are to appear in the 1925 Budget.

Lack of Effectives.—Again, the memories of the war have remained so vividly in the public mind that there has been great reluctance to call out the reserves for training. This may also have been due to other reasons, such as finance, but the fact remains that no reserves have been called out since 1918, though it is proposed to call them out next year, and allowance has also been made for this in next year's Budget. The lack of effectives on manœuvres has been very severely felt and the work done has naturally suffered from a want of reality.

It may be worth while here to quote the actual figures on which the Recruiting Law is based:

1½ classes	...	...	...	...	360,000
Professional soldiers, including technical troops.	...	...	...	...	100,000
Native troops (N. Africa and Colonies)	...	...	...	...	189,000
Foreign Legion	...	...	...	...	10,000
Total	...	...	...	...	659,000

Maintenance of the Strength.—An obvious question which suggests itself is, how is it possible to maintain the necessary strength of the army under the reduced period of service? There are two things which help.

Native Troops.—One is the increase of native troops. While there are 32 infantry, 5 cavalry and 2 air divisions in France and occupied Europe, North African Infantry regiments have increased from 4 in 1912 to 42 to-day. Cavalry have risen from 4 to 14 and artillery from 4 to 6.

The increase in Colonial troops is, however, limited, as there are two factors which directly influence this question—

- (1) Climatic conditions. Stations for Colonial troops in the Métropole have to be carefully chosen and are limited in number.
- (2) The *encadrement* in native officers. The problem on mobilisation would be the *encadrement* of some 700,000 colonial troops by a maximum of only 7,000 to 10,000 officers of the Colonial army.

Technical Troops.—The other thing which helps to keep up the strength is the increase in the voluntary enlistment of technical troops, which has been considerable.

Reduction to 12 months.—What, however, will be the situation if and when the period of service is reduced to one year, which had been considered as an eventuality at the time when the 18 months' law was voted.

On the 18th of October last, General Nollet, the War Minister, stated that he was now feeling his way towards this reduction, but that it could not take place under the present organisation.

Such a reduction, it is clear, would involve a re-organisation of the defence areas, of the mobilisation system and of the training cadres, also a new programme of armament.

It is a difficult problem as the *armée de couverture* would suffer, under the conscription system alone, a loss of some 125,000 men, and what measures could be taken to make up for such a formidable handicap is not clear. Either the general political situation would become such as safely to allow a diminution in the military strength or else it would involve a further considerable increase in the number of professional soldiers and native troops.

General de Lacroix, quoting the late General Buat, in 1922 said: "With a service lasting less than 18 months it would be impossible for us to meet all our military obligations. A militia system would be unsuitable for the Rhine frontier, and still less so for our political frontier. It would imply the absence of every *grande unité*, the absence of an efficient covering army and the absence of immediate danger."

What it means.—A year's service would really have two results:

- (1) The loss to the active army of about 125,000 men.
- (2) An advantage to the nation through the individual. The young soldier would be able to return six months sooner to civil life, begin to work for himself, lay the foundation of his savings and help to increase the birth-rate.

Arguments for.—The arguments in favour of a year seem to be the following:—

First, that it would be of advantage to the civil life of the people, as mentioned just now. This is probably true.

Secondly, that it would be cheaper. Now, various plans have been put forward by those who advocate it.

Roughly their idea is to have a professional army on the frontier of 100,000 men: also a colonial contingent of about 190,000 men available

for North Africa or the Colonies. Finally an annual contingent of some 250,000 men trained in the interior, incorporated twice a year, so that N.C.O.s promoted after five or six months' service are available to instruct the later contingent.

Arguments against.—The opponents of this plan say that a professional army even with reduced effectives would involve an expenditure at least as great as the saving effected on the shorter period of service, and therefore that a 12 months' service would not save money.

Secondly, that there would be great difficulty in obtaining the required number of *soldats de carrière*, unless their pay were much improved, which would mean still more expense. There are now, as I mentioned before, only about 21,000 *rengagés* and 50,000 *sous-officiers*.

Thirdly, that, failing the full numbers of professional soldiers, it would be impossible to form the *armée de couverture* with the reduced number of conscripts, as the year's training is insufficient.

Further, each class would have to come up in two contingents as at present, otherwise immediately mobilisable units would have no existence, and so, at any given moment, the mobilisable army in France would consist of the following:—half a class (the other half being under instruction), the professional soldiers, and the native units (not counting white detachments permanently in Tunis, Morocco, Syria, and the Colonies, say 50,000 men). This mobilisable army would not greatly exceed 250,000 men, which is just the strength of the German Forces on paper, *i.e.*, 100,000 (*Reichswehr*) and 150,000 (*Schutzpolizei*).

"The army," a high French authority has said, "constitutes a security against the dangers of war. Unless this security covers all risks, it is useless."

But an army thus constituted would not apparently have a big enough margin and therefore would not cover all risks. There is, further, the idea of replacing the active army corps centres by hundreds of different mobilising centres, thus substituting for the present system an army of army *cadres*. But this again would require at least 100,000 N.C.O.s, and re-enlisted men, and how are they to be obtained and at what cost?

The political aspect.—Many people think that the Government, in contemplating this reduction of service is simply attempting to fulfil electoral promises and to please the peasant class, which carries enormous weight in the country.

There is, however, this to be said, that if a year's service is to come, the time to introduce it would be very soon, while the 15 years' occupation is going on. It would anyhow be safer to do it while in occupation of the Rhine, and, when this ceases, to revert to a longer service if necessary.

Conclusion of this question.—In the opinion of the army generally it would not be going too far, I think, to say that any reduction beyond 18 months is regarded as dangerous. The gist of the whole matter seems to be that, as the War Minister said, with less than 18 months' service, the organisation would have to be altered and new armament plans evolved in

order to produce the *armée de couverture*, which is, and must remain, a constant.

There seems to be no possibility of this reorganisation being embarked upon for at least another year. The General Staff are not prepared to discard the pre-war organisation (of which the 18 months' service is the last reduced form) until the new one has been discussed and fully prepared in all its various aspects.

This vexed question may really be summed up in two words. Since the necessity for an adequate army is admitted, the people will have to choose between giving their personal service for 18 months as at present, or bearing the extra cost that a reduced service would almost certainly involve, in whatever form it may be presented.

II.

I pass now to my second question, how have the arms of the service been affected by the lessons of the war and by the present situation?

Generally speaking, there has been no alteration in tactics or training, beyond what has been imposed by the evolution of the most modern weapons.

Special efforts have been directed towards a closer co-operation between infantry, artillery, aircraft and tanks, and it is noteworthy that the last are classified with infantry.

Infantry.—The *groupe de combat*, corresponding roughly to two of our infantry sections, is the unit on which tactical training is based. It is interesting by way of comparison with our own system to note that the *groupe* is based upon and revolves round the *fusil mitrailleur*. In the words of the book, "the *groupe* is the elementary unit of instruction and fighting. It comprises an automatic weapon to which are attached men to serve it, supply it with ammunition, scout for it and protect it from capture." The *groupe* is commanded by a *sous-officier* and consists of about a dozen men, divided into two squads—gunners and skirmishers. Some think that an N.C.O. is not a sufficiently responsible commander for a tactical unit and so consider it a weakness in the chain. It is probable that there will shortly be a return to the half section system: *i.e.*, the 3 gun squads grouped together and the 3 skirmishers' squads grouped together. The reason is that the section commander has difficulty in controlling the 3 groups as at present constituted.

In the infantry armament, no change has, so far, taken place. The *fusil-mitrailleur*, the 37 mm. automatic gun, the Stokes mortar and the machine gun still remain, with the rifle and bomb, the normal infantry weapons. The present *fusil-mitrailleur*, however, dating from 1916, is very unsatisfactory and is definitely to be superseded. The new Chatellerault gun is still on trial and has not been issued. Its chief characteristic is a better loader. Certainly an improved model is highly desirable, with better stability and less readiness to jam.

*Weapons of accompaniment*¹.—In any case it is certainly inevitable that some alteration in the gun of accompaniment must take place soon.

The 37 mm. gun is reasonably mobile and very accurate and quick-firing, but not powerful enough.

The 1918 Stokes mortar is little use against protected targets and is somewhat inaccurate. These are the only infantry weapons of accompaniment capable respectively of direct and howitzer fire.

New gun of accompaniment.—What is aimed at is a single weapon able to deal not only with fixed points of resistance, whether entrenched or not, but also with mobile armoured points of resistance, such as tanks or aircraft.

It is thus clear that the new weapon must be capable of high angle as well as of direct fire. It would, therefore, be some kind of light gun-howitzer, with a maximum range of about 3,000 yards and a rate of fire of 12 rounds a minute. It must also be very accurate, very mobile, easily supplied with ammunition and fire a shell of not less than 9 lbs.

This ideal has not, so far, been reached, and it seems uncertain whether the ultimate result in France will be to have an improved special arm for each particular case—that is, a direct fire gun for targets in open country, a mortar for an entrenched or protected enemy, and a heavy machine gun against aircraft and tanks, as in America and here—or some combination of all three in one weapon, such as the Italians are now at work upon.

*Artillery developments*¹.—The trend of development in artillery before and during the war was towards:—

- (1) *Improvement of carriages and mechanism leading to more rapid fire*, e.g., the 75 mm. fires now 20 rounds a minute.
- (2) *Improvement of range*, e.g., the 75 mm. has increased its range from 6,500 m. to 11,000 m. (It has more elevation and a streamlined shell).
- (3) *Mobility*.—The 75 mm. and 155 mm. *court* are transportable on motor carriages. Heavy artillery is tractor-drawn, while the heaviest guns have caterpillar tractors.
- (4) *Numerical increase*.—For example, while there were only 40 heavy batteries in 1914, there were 1,500 at the Armistice. (220 mm., 240 mm., 320 mm.).

Artillery of Grandes Unités.—The artillery of the *grandes unités* is divided into divisional artillery (2 regiments, one of 75 mm guns (9 batteries) and one of 155 mm. howitzers (6 batteries)) and corps

¹ 37 millimetres = 1½ inches (roughly our 3 pr. calibre).

47 " = 2 " (nearly).

75 " = 3 " "

105 " = 4 " "

155 " = 6 " "

220 " = 8.4 " "

240 " = 9.2 " "

320 " = 12.6 " "

artillery (1 regiment of 105 guns and 155 mm. guns (6 batteries of each)). All these guns are horse-drawn.

Remainder.—All the rest is motor or railway transported and forms the *réserve générale d'artillerie*, which in peace time is distributed over the various mobilisation regions, but which on the outbreak of war would come *en masse* under the direct control of the Commander-in-Chief for distribution to armies according to tactical requirements.

The tendency in artillery research is towards further increasing the range of the 75 mm., inventing another and more powerful 75 mm., with a greater range, and constructing a light rapid fire howitzer.

The newest stream-lined cigar-shaped shell for the 155 mm. gun carries 3 kilometres further than the old one.

An interchangeable wheel and caterpillar system has been devised for the heavier guns and a model is in existence. The change can be made in half-an-hour. Financial difficulties prevent its general adoption.

Generally, there is a strong tendency towards motorisation of corps and divisional artillery.

Air Force.—In the air, the French are very much behind their programme, as laid down in the Loi des Cadres. This bill provided for 80 observation squadrons and 140 fighting squadrons (including bombing machines), which would bring the Air Force to about 8 per cent. of the total strength of the army. According to the aviation school, however, I believe there will only be 186 squadrons, all told, by 1928.

I will not venture to touch on the controversy regarding metallic planes and dirigibles, but the air people say that as the supply of spruce comes almost entirely from Canada, they are compelled, in view of the possibility of this supply being cut off in the future for any reason, to concentrate on metallic construction.

The strategic intention is to have a covering force in the air, behind which, in the event of war, a rapid mobilisation of a second *échelon* of military planes would take place. It is noteworthy that the same work is often done in the Air Force by men of different ranks and this makes for greater mobility in the *personnel*.

There is a feeling that as the Mediterranean is really a British lake, and that, as the safety of their communications with North Africa is vital to the French, it is necessary for them to establish a mastery of the air, in the same way that we have established a command of the sea.

Tanks.—As regards the tactics and organisation of tanks, there has been little change since the Armistice, beyond efforts to maintain a still closer co-operation with the Infantry. Several types of tank were experimented with during the war, culminating in the char Renault. This was found satisfactory at the end of the war, largely because of the indifferent anti-tank armament used by the Germans and is still in actual use.

The adoption, however, by Germany of a heavy 13 mm. machine gun for use against tanks and aircraft, with high muzzle velocity and powerful

penetration, in place of their rifle of the same calibre, has brought about a change in the French tank.

A new tank, result of the co-operation of several of the leading French constructors, is now in existence, though only as a model. Its principal features are greater speed, stronger armour and improved power of visibility from inside. While the *char Renault* attained a maximum speed of 7 kilometres (4½ miles) an hour, the new one can go from 15 to 20 (10-13 m.p.h.).

It carries 3 men instead of 2 and will be armed with 2, possibly 3, machine guns and a 47 mm. gun, or even perhaps a 75 mm., giving higher penetration than the 37 mm., now in use with the Renault.

There will probably only be the one type and though the old Renault is still the *char d'assaut* of the army, the new tank would at once be ordered in quantity if war broke out. That as yet there is only a model, is due to lack of money, an almost universal objection to the actual construction of so much new military material in France, and to the fact that large stocks of the Renault type are in existence.

III.

I pass now to the *system of training and the objects it has in view*.

The principal objects aimed at may be summed up shortly—mobility, fire-power, and saving in *personnel*.

If in conjunction with these three objects we place the three probable phases of a possible future war between France and Germany, we get a light thrown upon present military efforts in the former country.

First phase entailing mobility.—Assuming that war breaks out while the French still occupy the Rhine, it is intended that the first phase shall be fought east of that barrier. An immediate blow must be struck by the covering force, entailing great power of mobility for that force.

For this blow, it is armed with, and will use the weapons of to-day.

But while this blow is being struck and while the enemy is recovering from its effects, industrial mobilisation will have begun and production of new weapons in great quantity will be proceeding,—which leads to our second object, namely preponderance of fire-power.

Second phase entailing fire-power.—When this new fire-power comes into action, the second phase will have begun.

Third phase entailing saving in personnel of infantry.—As this material increases in volume, a moment will arrive when the third phase, the reduction of infantry in favour of material, will ensue.

Artillery, especially howitzers, will increase rapidly in quantity, as will tanks and aeroplanes. In the last phase, then, it is supposed that there may be a recasting of the infantry, division, in the sense that it will become stronger in material and weaker in effectives.

Training, then, is based generally upon these three objects:—mobility, fire-power, and reduction in man-power—taking the nation as a whole.

It must be borne in mind, however, that such a reduction is the last phase and is in no sense applicable to the covering force.

Training of officers (Active).—As to the training system for officers, I have no time to detail the whole organisation, and regarding the officers of the active army, a very few remarks will suffice.

During the war, many specialist schools and others were organised to enable officers to keep in line with the changing conditions and the flood of new material. Also to improve co-operation between the various arms, the idea of grouping officers of different arms at similar courses—called *cours communs*—came into being.

In the extensive training project put forward in 1919, this idea was considerably developed. Military schools were to be grouped, specialist schools (called *écoles d'application*) were to be organised to increase the technical value of officers' knowledge, refresher courses for officers on promotion were to be instituted and the Reserve officer was to be provided with a training as like to that of his active brother as possible. Of this project only portions have been realised.

The big military schools, St. Cyr and the Polytechnique, furnish between them officers for all arms.

St. Cyr provides for infantry, cavalry, tanks, and air force, while the gunner and the sapper are found by the Polytechnique.

Certain *écoles d'application* have been established, such as the tank school and the aviation school at Versailles and an infantry school in the same place, which also provides the promotion refresher courses I mentioned just now.¹ The *cours communs* for senior officers also function at Versailles.

The plan on the board shows the various steps in the active officers' career.

PLAN.

A shows the steps in the career of those who become officers on leaving the big schools.

B shows the steps in the career of those who become officers from the ranks, being already N.C.Os.

A.

(i) *On leaving St. Cyr.*

Infantry officer goes straight to Regiment.

Aviation officer does a stage at the aviation school.

Cavalry officer does a stage at the cavalry school (Saumur).

Tanks officer does a stage at the tank school (Versailles).

¹ The latest idea is that these refresher courses, though continuing to function, will not coincide with promotion.

(ii) On leaving *Polytechnique*.

Artillery officer does a *stage* at (Fontainebleau) *Artillery* school.

Engineer officer does a *stage* at (Versailles) *engineering* school.

N.B.—Only about 10 per cent. of *Polytechniciens* go to the Army.

Compare with this R.M.C., Canada.

B.

(i) On leaving *St. Maixent*—

Infantry Officer goes to regiment.

Air Force officer does *stage* at *Air* school.

Tanks officer does *stage* at *tank* school.

(ii) On leaving *Saumur*—

Cavalry officer goes to regiment.

(iii) on leaving *Poitiers*—

Artillery officer goes to unit.

(iv) on leaving *Versailles*—

Engineer officer goes to unit.

The important thing to notice in this system is the duality of the training of the officer from the schools and the officer from the ranks.

Reserve.—I would like, however, to say something further as to the training and organisation of the reserve officers. Their organisation is considered of great importance, and much attention has been paid to it. Apart from the officers provided by the *écoles militaires*, one of the following conditions must be fulfilled in order to become a Reserve officer :—

- (1) He must have served in the active army as an officer.
- (2) He must have served in the active army as an N.C.O. for 5 years.
- (3) He must have attended for 6 months a course at one of the schools for Reserve Officer Students (*E.O.R.*) which are organised in some of the garrison towns, and have passed the competitive examination for Reserve officers

Again, the civil schools and universities fall into two classes as regards recruiting for Reserve officers.

(1) Those in which a higher military preparation is organised and made compulsory and (2) those in which this preparation, though optional, can only be given to those who have reached a certain standard of general knowledge.

All the young men in these establishments who obtain a higher military certificate are admitted to the six months' courses for reserve officer students above mentioned, and at the end of these courses may enter for the competitive examination. As a result of this examination, they become Reserve officers or N.C.Os. and as such complete a year's service

If they fail to get sufficient marks to become at least an N.C.O. they have to complete their full term of 18 months.

There is also a fourth way of becoming a reserve officer.

Any man over 18, before being called up for service, may enter for the same competitive examination for Reserve officers. If successful he finds himself in exactly the same position as those who have been through the six months' course and passed the examination.

Finally, enlisted and re-enlisted men may enter for that entrance examination to the Reserve officer student schools, which takes place a year before the expiry of their contract. It will be seen from these measures that every encouragement is given to all the best types of young Frenchmen to become Reserve officers, and it should be noted that the whole plan is completed by the obligation in all cases of 6 months' practical command in the active army, an indispensable factor in the creation of useful leaders.

New Bill.—In the Bill dealing with the Reserve *cadres* voted last March, a new Reserve *cadre*, called *assimilés spéciaux*, was instituted. The intention was to form a category open to those employed in technical civil work. This means that no civil employment will permit a Reserve officer of any class to escape service in some unit on mobilisation.

The *assimilés spéciaux* are *personnel* destined to officer special corps to be formed on mobilisation.

A word as to the position of the Reserve officer.

Reserve officers may be in one of the following positions :—

- (1) In the *cadres*.—This means that he would have normal employment in a military formation on mobilisation.
- (2) An Officer *hors cadres*, is an officer at the disposal of the War Office for special employment on mobilisation, such as in the *cadre-des assimilés spéciaux*.
- (3) In *non-disponibilité*.—This is a Reserve officer temporarily released from service either for reasons of health or by disciplinary action. He can only so remain for 3 years, if it is a health question. If then still unfit, he is struck off the *cadres*.
- (4) Position of *Officier honoraire*.—Either an officer who has reached the age limit fixed for an active officer plus 5 years, or an officer struck off the *cadre* for health reasons before reaching the age limit, or an officer who has completed his active army service and reached a higher rank in the Reserve than he held in the Active.

N.C.O.s—As regards the N.C.O.s of the Reserve, these fall into two categories, *i.e.*, 1st and 2nd Reserve *cadres*. Those placed *en disponibilité* of the active army form part of the 1st Reserve Cadre, and are recruited from men leaving the active service after 15 years. The 2nd reserve is formed from among those N.C.O.s. of the active army who have been retired for age, and also from those N.C.O.s. and *personnel* who have have finished their time in the 1st Reserve.

The chief result of the bill is to give the Reserve officer a definite status in one corps, *le corps des officiers de Réserve*. Also by the

formation of the *cadre des assimilés spéciaux* it prevents any Reserve officer escaping military service on mobilisation by reason of any peace time civil occupation.

Common Training.—It will be observed that the whole tendency is towards a common training for active and Reserve *cadres*, towards a *rapprochement* as close as possible between them, and thus towards a common doctrine for the whole officer corps.

Conclusion.—In conclusion, it may be said that the army is in a state of transition, both as regards *personnel* and armament. The controversy over the length of service is largely responsible for the one, while lack of money is a serious factor against the stabilisation of the other.

Whether or not further external and internal political changes will re-act upon military questions as regards general organisation, only the future can show.

In any case the soldier in France is convinced that Germany is on the way to become once more a first-rate military Power and that, in spite of financial and other obstacles, he must be prepared to meet an eventual attack with the best organisation and armament that modern military science can devise.

DISCUSSION.

COLONEL A. G. CHESNEY: I should like to ask the lecturer how many coloured troops there are serving in France at the present time. There are a great many coloured troops on the Rhine, while before the war there were none in France. Is it intended to keep them there in the future?

CAPTAIN HARRISON: About two-thirds of the nine mixed divisions consist of coloured troops, and it is certainly intended to keep them in the country as far as I know.

COLONEL CHESNEY: Do they stand the climate well?

CAPTAIN HARRISON: Yes, but the French do not allow Colonial troops (*i.e.*, other than North Africans) to serve except in the Mediterranean basin. It is the climatic conditions which govern the limits of the increase of the native troops—that is to say, for service in France or the Mediterranean basin. The natives (apart from North Africans) can really only stand the South of France.

LIEUT.-COLONEL J. GRIMWOOD, C.B., D.S.O.: I would beg leave to add a brief sketch of the French Army system of pay and accounts, as it appeared to me during the war. The real unit of administration is the regiment. The regiment has its *trésorier* (treasurer) in peace time, and its *officier-payeur* in time of war, who is actually in the regimental unit itself, so that the soldier can always get into touch with somebody who understands the technique of accounts and who can explain to him how his account stands. When a French regiment is on the move, during active operations, you see a non-commissioned officer, under the *officier-payeur*, trudging along in the line of route with his ledger hanging over his back. The French Army finds that this system is extremely satisfying, not only to the soldier, but to the officer and to regimental headquarters, in which the *trésorier* is also the Secretary of the *Commission d'Administration*. Under those circumstances they find the *trésorier* an extremely useful fellow. The administration of accounts in a battalion is easier than ours,

because there is a greater local latitude in dealing with financial matters, and certain allowances are made under various heads by way of an allotment in cash. In that way the officer is brought into regular touch with the cost of running his company—the cost of stores and the cost of materials under the stock accounts which are made. A little higher up in the system there is a very important service in the French Army, and linked up with the *trésorier*, called the *Intendance*. This is composed of specially selected officers, known as *intendants* and *sous-intendants*, who are chosen after passing difficult examinations in administration, law, pay, allowances, regulations and so forth. After the fighting services, which naturally hold the palm in any army, the *Intendance* is the *Corps d'élite* of the French Army. They find these officers most useful because they continue "the chain" of the accounts right up to the very top of the fourth directorate in the War Office in France. At the War Office the *Intendance* is represented by a Lieutenant-General and four Major-Generals, all of them are entrusted with the Army's accounts from top to bottom. Then there is a "*cours des comptes*," which is a civilian body, a body of a great interest to us. This system stood the test of war. Speaking of "finance" in the way in which I understand "finance," namely, as "*the expenditure of money and the value that you get for it*," the finance of the French Army is thus kept in the very closest touch right from the firing-line up to the War Office, and remains throughout in the hands of soldiers.

CAPTAIN C. F. HILL: In the British Army, in front of railhead we had a system for supplies and ammunition which is based on mechanical transport and horse transport, namely, the Divisional M.T. Company, the divisional train, and the divisional ammunition column. Can the lecturer tell us the system which the French Army adopt in front of railhead?

CAPTAIN HARRISON: I think the proportion between the motor transport and the horse transport is very analogous to our own. The possibilities of increasing the motor transport are naturally governed by the conditions of the campaign.

LIEUT.-COLONEL G. BOWRING: I would like to ask the lecturer if he can tell us anything about the French Staff College.

CAPTAIN HARRISON: I think the recruiting for the Staff College has rather fallen off lately, and the French are somewhat anxious about this. It was extraordinarily good before the war. The actual time spent in the Staff College is two years. The entrance is by competitive examination. I think it is possible that Government grants may be made to successful candidates at the entrance examination to improve recruiting for the É. de G. The College is run on lines analogous to ours.

LIEUTENANT RIXON BUCKNALL: I should like to ask the lecturer whether in the French Army there is any permanent establishment for the exploitation of chemical warfare. Have they any permanent companies for the use of gas, such as exist in the American Army, or have they only a school and a nucleus of a gas establishment as we have in the British Army?

CAPTAIN HARRISON: The present system is that each unit has a gas officer (*un officier "Z"*) and a very small establishment of trained men, who put the classes through gas drill. There are no permanent companies, I believe.

THE CHAIRMAN: Ladies and Gentlemen, I am very sorry we have not had

¹ A full account of the French Staff College was given in the R.U.S.I. *Journal* for February, 1925.

the advantage of the presence of Lord Derby here this afternoon, I have practically no remarks to make on this interesting lecture, except that one has a sort of morbid satisfaction in seeing that even in a country where there is a law of conscription, which makes everyone capable of bearing arms a soldier, such a country is face to face with difficulties in getting a thoroughly efficient Army. It is quite a revelation to me to find that the French seem to rely for recruitment so much on their Colonial possessions. It seems to me that in every country, if the boys are educated to be truly patriotic, there should be no difficulty in obtaining an Army and a Navy thoroughly efficient and adequately numerous to make an attack very improbable, and the years spent in acquiring physical fitness and efficiency should improve the manhood.

It now only remains for me to bring the meeting to a close by thanking, on your behalf, Captain Harrison most warmly for the very able lecture he has prepared.

On the motion of the Secretary (Lieut.-Colonel Sir Arthur Leatham, K.C.V.O., C.M.G.), a hearty vote of thanks was accorded to Sir Reginald Tupper for presiding, and the meeting terminated.

MARITIME POWER AND CONTINENTAL ALLIANCES.

By C. E. FAYLE, Esq.

On Wednesday, 14th January, 1925, at 3 p.m.

VICE-ADMIRAL SIR GEORGE P. W. HOPE, K.C.B., K.C.M.G., President,
Royal Naval College, Greenwich, in the Chair.

THE CHAIRMAN: Ladies and Gentlemen, Mr. Fayle is well known, certainly to many of us here, as the writer of the "Official History of Sea-borne Trade during the War," which, I may say, is a most interesting and valuable work. In compiling that book he had the opportunity of studying, from authentic records, the work that was done by this country in the Allied cause during the War, which is, I think, still not fully realised. His lecture will, I am sure, from my own personal knowledge of him, prove most interesting and instructive, and I will now ask Mr. Fayle to deliver it.

LECTURE.

ADMIRAL SIR GEORGE HOPE: Ladies and Gentlemen, It is with quite unaffected diffidence that I rise to address you on the subject of "Maritime Power and Continental Alliances." There are many aspects of this subject on which I have no title to speak, least of all to such an audience as this. I take it that I owe the honour of an invitation to address you to the fact that, in writing the "History of Seaborne Trade during the War," for the Historical Section of the Committee of Imperial Defence, it was my duty to spend some years in studying one special aspect of the question, which lies a little outside the normal course of naval and military studies. To that side of the question I shall rigidly confine myself.

DEFINITION OF MARITIME POWER.

Let me begin by making clear what I mean by Maritime Power, By Maritime Power I mean ability to make the fullest possible use of the sea-routes in time of war as in times of peace, for all purposes of transport and supply. In part that is a question of naval strength and of the co-ordination of naval and military operations. With these I have nothing to do. But Maritime Power implies more than this: it implies the possession of a great mercantile fleet and a highly-developed system of oversea trade. Unless you have behind you a big and efficient

mercantile marine, the Army will look in vain for transports and store ships; the Navy for oilers, colliers and supply vessels. The command of the sea may be won, but it cannot be utilised.

Again, unless you have a highly developed system of oversea trade—world-wide, elastic, capable of adjustment to the new demands and new conditions introduced by war—ability to protect the sea-routes will lose more than half its value. If our soldiers and sailors are to be fed, clothed and equipped, if the Army and Navy are to be supplied with all they require in the way of war material and munitions, we must have not only naval force to protect the merchantmen; not only the merchant ships themselves; but a commercial and financial organisation in touch with every source of supply; export industries wherewith to pay for the supplies we need; credit that can be stretched to cover an expanded demand for imports.

It is the combination of all these factors that I call Maritime Power. Without naval strength, our oversea trade will cease in time of war. Without oversea trade and the industrial and financial strength derived from it, naval strength will be robbed of its significance.

RELATIONS OF MARITIME POWER TO FIGHTING STRENGTH.

War, it is truly said, can only be won by fighting; but we are apt, at times, to forget how absolute is the dependence of fighting strength itself on those economic activities which dreamers dismiss as money-grubbing. Soldiers and sailors must be fed; and since we have to-day no Moses to call down manna from heaven, the food must be produced at home, or procured from abroad, in exchange for home products, or on the credit created by our own commerce and industry. The very weapons of war—ships, guns, torpedoes, tanks, munitions, motor transport—are the products of industrial activity. If the raw material from which they are made is not procurable in this country, it must be brought from abroad, and the purchase paid for or financed. If, for any reason, we cannot make them, we must buy them, and our export industries must pay the bill. Every man maintained in the fighting line, every shell expended, represents the result of work accomplished, behind the lines, by the manufacturer, the merchant, the banker, and the shipowner.

In every country at war the same process must go on; and while our own position is peculiar, in that *every* commodity and *every* material not procurable from our own resources must be brought from oversea, our dependence on the sea-routes differs only in degree, not in kind, from that of Continental States. The progress of invention and industrial development has left every country dependent, not merely on imports, but on oversea imports, for essentials of national life and military strength.

The result of the industrial revolution at the beginning of the nineteenth century has thus intensified for every industrially civilised

State the importance of oversea trade. It has rendered the relation of Maritime Power to military strength far more direct than in the past. In the seventeenth and eighteenth centuries, the importance of Maritime Power was mainly financial. All States were practically self-sufficing as regards foodstuffs, and they could supply from their own resources almost everything required for the equipment of their forces. Naval stores—timber, hemp, flax, and tar from the Baltic—formed the chief exception. On the other hand, the troops and sailors had to be paid, and the supplies required for the Army and Navy had to be paid for out of the revenue derived from the productive classes, or out of loans obtained from them. What is more, owing to the rudimentary organisation of credit, they had to be paid for, to a great extent, in actual cash. Macaulay gives a vivid picture of the General Court of the Bank of England called to consider the demands of William III. for funds, without which his operations in Flanders must come to a standstill.

"'If our notes would do,' it was said, 'we should be most willing to assist His Majesty; but two hundred thousand pounds in hard money at a time like this'. The Governor announced explicitly that nothing but gold or silver would supply the necessities of the Army in Flanders."

It was largely for this reason that the eighteenth century economists attached so much importance to the export of goods and the import of coin and bullion. In their view, the importance of foreign trade lay not so much in supplying essential needs—the great bulk of that trade was concerned with goods not then regarded as vital necessities—but in creating wealth, and above all, in building up the national stock of the precious metals. Particularly valuable to France and Great Britain was the Colonial trade, the national monopoly of which greatly enriched a privileged class of traders, and provided a flow of high-priced luxury goods for re-export, in return for which gold and silver was drawn from the Continent.

Spain, of course, drew her treasure direct from her American possessions, and I do not think the relation between the arrival of the treasure fleets and the movements of Spanish Armies has even yet been sufficiently studied. We do know, definitely, of several occasions in the seventeenth and eighteenth centuries when lack of money, arising from the capture or holding-up of the treasure fleets, paralysed the Spanish movements at the crisis of a campaign, or dictated a new turn in Spanish policy. Whether the capture of the *flota* was or was not a proper object of British strategy is a question outside my province. But, in discussing that question, the military importance of its arrival must be taken into account.

For France and Great Britain, the problem was the general maintenance of oversea trade, and especially the Colonial trade. Here again the connection between finance, operations, and diplomacy, needs to be further explored; but I would remind you that it was that very military monarch Louis XIV who said, during the War of the League

of Augsburg, "The last piece of gold will win." It was a reflection from which he should have derived small comfort. If you study the events leading up to the Peace of Ryswick, the Peace of Utrecht, and the Peace of 1748, you will find that the financial exhaustion of France was a fundamental factor in the diplomatic problem. In 1748 especially, as Admiral Richmond has shown in his excellent book on the War of the Austrian Succession, the terms, however unsatisfactory to this country, were distinctly more favourable to the Allies as a whole than was warranted by the general military situation on the Continent, and there seems no doubt that the decisive factors were the financial exhaustion of France, arising from the destruction of her oversea trade, and the power of endurance derived by the Alliance from the wealth created by British commerce.

To-day, as I have already suggested, the bearing of Maritime Power on military strength is much more direct than in the past. Thanks to the application of science to warfare and the enormous development of military and naval material, it is not merely a matter of supporting the financial burden of war, but of procuring supplies essential for war purposes. Without coal and oil fuel for the navy and for military transport, petrol for the air service, cotton and nitrate for explosives, immense quantities of steel and copper for armour plate, guns, and shells, rubber for field telephones and so on, you cannot fight at all. The ends of the earth have to be ransacked for tungsten, molybdenum, and all sorts of rare products of which we hear little in time of peace. So great and so various have become the demands of the armament and munitions industries that hardly any country, if any, can equip its fighting services without large imports from oversea.

The larger the force to be equipped, the greater, of course, are the demands for equipment and munitions. A country quite capable of feeding and clothing from its own resources an army of 100,000 men, may be quite unable to equip an army of 1,000,000. Every division added to the field force increases the demand for munitions. Further, the larger the force, the greater is the number of men withdrawn from production, and the greater the difficulty, even when materials are available, of producing at home all the requirements of the fighting Services. Every man called up "counts two on a division"—a fighter the more to be supplied, a worker the less to produce supplies.

Lastly, Maritime Power has now become an essential factor in sustaining the life of the nation itself during the war. No one will deny the necessity for subordinating the requirements of the civil population to those of the fighting services; but there is a certain minimum level, as regards food and other physical necessities, below which the standard of life cannot be allowed to sink without the danger of disturbances which will seriously impair the will to victory, and hamper the war effort. And the tendency to-day is to make it more and more difficult for any European State to maintain this level indefinitely if deprived of seaborne imports.

MARITIME POWER AS A CONTRIBUTION TO AN ALLIANCE.

So much for the war importance of Maritime Power. But our subject to-day is not merely the importance of Maritime Power in itself, but the position of a country possessing such power in a high degree, when allied with Continental States possessing that power only in a lower degree.

Every alliance is a partnership, and the secret of successful partnership is that each partner shall contribute to the common effort, in the first place, that which he can give better and more effectually than the others. Three men may join together to run a business, one of whom is specially skilled in the making of a commodity, one in marketing, one in accountancy. It will be useful, obviously, for each of them to be able to lend a hand in departments other than his own; but the first requisite for success is that the manufacturing partner shall, first of all, bend his energies to producing the best possible goods in the best possible way; that the salesman shall, first of all, devote himself to getting into touch with customers, appointing agents, and organising publicity; that the accountant shall concentrate on accurate bookkeeping and careful costing. If the salesman neglects his customers in order to give time in the workshop; if the accountant spends his time running after new customers, when he ought to be analysing expenses and detecting sources of waste or openings for economy—then there is likely to be a smash.

So with a partnership between nations. It may be that every member of an alliance is in a position to wage war by sea and by land, and to support the efforts of the combined forces by a steady flow of supplies; but it will generally be found that the degree in which each member of the alliance can contribute to the naval, the military, and the financial effort, varies considerably; and in that event, it is desirable that each Power shall concentrate *first* on doing for its Allies what they cannot so easily or so effectively do for themselves.

In the majority of great wars in which this country has been engaged, she has engaged as member of an alliance, and I think it is fair to say that, in most of the older wars, her contribution to the allied effort was predominantly maritime. Please do not regard me as underrating the value or the achievements of the British contingents in the main theatre of war, or the importance of those operations undertaken by the British army, as a separate force, in theatres where sea-power enabled it to be used with special effect. I am not indifferent to the glories of Blenheim and Minden; I am not ignorant of the relation between Vittoria and Leipzig. But, I think it is true to say that, while the burden of the war at sea usually fell almost exclusively on Great Britain, her Allies generally included States with larger military resources in man-power and organisation. They were also nearer, geographically, to the main theatre of war on land, and thus able to bring their armies more quickly and easily into the field. These States, however, were

greatly inferior to Great Britain in commercial and financial strength, and it was to a great extent by means of British subsidies that their armies were raised, equipped and maintained. In 1742, for instance, the subsidies amounted to very nearly £1,750,000—about one-sixth of the total money voted for the year. During the Revolutionary and Napoleonic wars, the subsidies, and loans which were in effect subsidies, paid to Prussia, Austria, Russia, Spain, Portugal and numerous other States attained, for those days, very large proportions. From 1808 to 1814 inclusive they amounted to £29,000,000. In 1814 alone they rose to £8,400,000, irrespective of supplies in kind amounting to another £1,580,000. How large a part British subsidies played in cementing every alliance is a commonplace of history.

ECONOMIC NEEDS OF OUR ALLIES IN 1914-18.

Now let us turn to the Great War of 1914-18, and in the first place let me emphasise the fact that the economic demands of the Allies—their demands for assistance in the supply of their forces—were at least as vital as in the older wars, and far greater in extent. We hear a great deal to-day about Inter-Allied debts; but do we always realise just what those debts represent in the way of British contribution to the joint war effort?

I do not think most people fully appreciate how enormous were the import demands of the Allies during 1914-18, or how essential those demands were to their powers of resistance. Let me give you a few, a very few, figures that have already been published. In 1917, when tonnage was very short, and non-essential imports were drastically restricted, the French imports amounted to over 32 million tons—very nearly as great as our own. The Italian imports exceeded 11 million tons. Of the French imports, 17 million tons; of the Italian, 5 millions were coal and coke. France had been a large importer of coal before the war. The German occupation of the north-eastern provinces accentuated her need. Italy, producing practically no coal at all, was in still worse case. Without large and regular imports of fuel her munition factories must close down, her ships cease to run, her armies be crippled for lack of transport.

Again, the French imports included 7 million tons, the Italian 1½ millions, of munitions, and of ores, metals, and chemicals, required mainly for military purposes. These they must have or lose the power of continued resistance.

Finally, France imported nearly 6 million tons, Italy 3 million tons of food and feeding-stuffs. We are accustomed to think of those countries as more or less self-sufficing in respect of food; but both normally imported considerable quantities, and under the stress of mobilisation, the German invasion, and bad weather, the imports of food and of military fodder became absolutely vital during the war.

Russian commerce, of course, was cut down to a small fraction of

its normal volume by the closing of the Baltic and Black Sea, and the conditions thereby created played a large part in producing the Revolution; but in the White Sea season of 1916 alone, about 2½ million tons of coal and munitions were poured into Archangel. More self-sufficing than France or Italy as regards foodstuffs, Russia was even less able to equip her armies without external assistance.

Neither France, nor Italy, nor Russia could have satisfied their needs without British help. In the first place, the results of mobilisation and of the German invasion of north-eastern France, so cut down their productive power that they could produce little for export, and, when Allied credit was exhausted, it was the financial strength of Great Britain that made imports possible. In the second place, the tonnage under the French, Italian, and Russian flags was physically incapable of supplying their needs, and British ships made good the deficiency. In the third place, the strength and elasticity of the British financial and commercial system often rendered it possible for the Allied needs to be met most effectively by keeping the purchase and finance of supplies in British hands.

To a large extent, the needs of the Allies were met from the resources of these islands. Domestic consumption was drastically restricted, exports to our most important markets were drastically cut down, in order that coal, munitions, and equipment might be poured into the Allied ports. For the rest, a great part of the Allied imports from other countries were purchased through British agency, financed by British credit, and carried in British ships. We were workmen, general carriers, and bankers for the whole Alliance.

Let me quote just two or three examples of the Allied demands on our shipping and economic resources. We lent to France, for the Salonika Expedition, 26 ships averaging over 5,000 tons gross. Of the American troops, over a million were brought to Europe in British ships. On October 31st, 1918, no less than 29·5 per cent. of the total available deadweight tonnage under the British flag was in direct naval or military employment; yet on the same date 17·5 per cent. of that tonnage was in the import service of France and Italy alone. Or, to approach the matter from another angle, 45·4 per cent. of the tonnage carrying imports to France, 51·6 per cent. of the tonnage carrying imports to Italy, was British. Of the rest, a large proportion was neutral tonnage under British control.

Before the war neither France nor Italy imported meat to any appreciable extent, and they possessed neither insulated tonnage nor knowledge of the trade. During the war they were driven to import large quantities of frozen meat for their armies, and of 1,375,000 tons so imported, practically the whole was bought through British Agency, and more than three-quarters was carried in British ships. The Wheat Commission, the Wool Committee, and other purchasing departments, all bought largely on Allied account. In 1917-18, when the French and Italian harvests partially failed, the crisis was met by diverting

2,000,000 tons of cereals in British ships, over and above all cargoes carried by tonnage previously in Allied service. The grain was diverted from British supplies, the ships from the vessels available for British trade. Of some 5,250,000 tons of coal and munitions received by Russia during 1916 and 1917, British shipping carried two-thirds. As regards supplies actually sent from this country, it is significant that, while exports to France, Russia, and Italy amounted, in 1913, to only 13 per cent. of the total export trade, by 1917 the proportion had risen to 35 per cent.

Did time permit, it would be easy to quote many instances in order to show how numerous, how extensive, and how sudden were the emergency demands made by the Allies for economic assistance, and how great was the strain of fulfilling them. The records of the Transport Department, of the Shipping Control Committee, the Ministry of Shipping and the Allied Maritime Transport Council are eloquent both as to the gravity of the Allied needs and the burden they imposed on British resources. I have said enough, however, to show that the specialised functions of Great Britain, as the Maritime partner in the Alliance, were of not less but more importance than in the past.

EFFECT OF MILITARY EXPANSION.

Over and above this, we found ourselves called upon to raise an army on the Continental scale, and by the end of the war the ration strength of the British forces at home and abroad had grown to 5,363,000 men. The situation was almost wholly without precedent. It was not that we had substituted one form of war effort for another; we were attempting to do all and more than all that we had done, in previous wars, in the spheres of finance and supply, and *at the same time* to pull our full weight in the military sphere.

I do not wish to suggest or imply that the acceptance of this double burden was avoidable. That is a question involving many factors that are outside my province. But it is very important that we should not forget what this burden implied.

By July, 1918, about 45 per cent. of the male workers employed in industry, agriculture, transport, and commerce had actually joined the colours, and though their places had, to a great extent, been taken by new workers, chiefly female and juvenile, the proportion of skilled workers was very seriously reduced. Further, of the total workers, male and female, industrially employed in 1918, 61½ per cent. were on Government work, mainly for war purposes. Coupled with the enormous demands of the Ministry of Munitions, the War Office, and the Admiralty, for raw materials such as steel, copper, wool, etc., this meant a very great reduction in the output of the civil industries. The effect of this reduction in output, in reducing domestic supplies and forcing up prices, was serious in itself; but it was not the gravest feature in the situation. More vital was the effect upon the export industries. In 1913 exports

from the United Kingdom amounted to 82 per cent. of the import values—the balance being more than covered by “invisible exports,” such as freights. By 1918, exports were only 40 per cent. of the import values. The bearing of this we shall see in a moment.

This was not all. The shortage of labour caused by recruiting, and the shortage of material caused by the demands of the Admiralty and Ministry of Munitions for steel, were jointly responsible for a fall in the output of merchant tonnage from an average of 1,660,000 tons gross during the five years before the war to 540,000 tons in 1916, and, although production increased after that date, it never rose to the peace level. I lay stress on this because it is important to bear in mind that the heavy losses suffered during the submarine campaign were not wholly unprecedented. What *was* without precedent was our failure to replace them. During the Napoleonic War of 1803–14 it is estimated that 40 per cent. of the tonnage on the register at its outbreak disappeared through capture or wreck. But not only were those losses made good by prizes and new construction; so busy were the British shipyards that the tonnage of 1814 actually exceeded, by 21 per cent., that of 1803. A strange contrast is presented by the position in 1918. Of nearly 8,500,000 tons of ocean-going shipping destroyed, captured, or wrecked during the war, less than half had been replaced by new construction in British yards, and the net result, after taking into account all forms of loss and replacement, was a decrease of 18 per cent.

Of the remaining tonnage, nearly 30 per cent., as we have seen, was employed for direct war purposes—a proportion mainly due to military requirements. Further, the annual carrying-power of the ships in commercial employment was reduced, throughout the war, at a moderate estimate, by 15 to 20 per cent., as the result of port congestion, due to recruiting from port and railway labour, and to military demands on port and railway facilities.

The effect of these conditions was a drop in the volume of British imports from about 54½ million tons in 1913 to 37 millions in 1917 and 35 millions in 1918. It is sometimes suggested that the greater part of this reduction was in imports of luxury goods. That is quite untrue—luxury goods are mostly of high value and small bulk and require little shipping space. It is the great bulk cargoes—grain, timber, ore, cotton, and the like that provide our ships with the main part of their cargoes; it was these that had now to be drastically cut down. Food was short; clothing was short; materials for the export trade were short; and it was only with the utmost difficulty that the fighting services could be supplied with the food, equipment, and munitions they required.

The effect, however, was not confined to ourselves. A heavy fall in the coal output, due to recruiting from miners; a slackening of production in the export industries; the demands of our own armies, and the shortage of carrying-power—all these combined to render it difficult or impossible to fulfil the requirements of the Allies for fuel, munitions, and foodstuffs. The Italian coal stocks were exhausted,

and it was with the utmost difficulty that sufficient supplies could be shipped to enable Italy to carry on from month to month. The Italian coal crisis was permanent and a constant source of acute anxiety. The French coal supplies were always short of requirements. Both in France and Italy the food supply gave rise to the gravest anxiety in 1917-18. We did not make the big diversion of cereals I have already referred to until we were satisfied that the shortage of food in those countries was really serious and causing grave trouble. The joint Allied Munition Programme had to be seriously cut down, and had the war continued into 1919, an immense effort would have been necessary in order to build up the depleted stocks.

BREAKING POINT NEARLY REACHED.

It is, perhaps, not always realised how nearly we broke down under the strain. At one point in 1917, before the growth of mercantile tonnage losses had been checked, we were quite definitely within sight of the period at which we should be unable any longer to bear the threefold strain of supplying the minimum physical needs of our own people, maintaining our own forces in the field, and fulfilling the essential demands of our Allies. And this situation, it must be remembered, was not produced merely by the depredations of the submarines; it was the result of a combination of factors. In addition to the losses inflicted by the U-boats, there was the immense diversion of tonnage to military purposes, the deterioration in the annual carrying-power of the ships, and the decline in shipbuilding—all fruits of military expansion.

There is a further point of most vital significance. In order to fulfil, with our depleted shipping resources, the minimum requirements of ourselves and our Allies, it became necessary to effect purchases, so far as possible, from the nearest source of supply, in order that our shipping might be concentrated on the shortest tracks. Thus our imports from the United States rose from 18.4 per cent. of the whole in 1914, to 39.2 per cent. in 1918. We had then this position. A larger and larger proportion of our imports was coming from America; a larger and larger proportion of our exports was going to the Allies; shipping services of great importance to our export trade and to the freight-earning powers of our Mercantile Marine had been obliterated or drastically restricted in order that tonnage might be diverted to the Atlantic. The *post-bellum* results have been felt in the tangle of Inter-Allied indebtedness and the fluctuating exchanges, which have rendered the transition from a war to a peace economy so difficult.

That, however, is not my main point. What I want to emphasise is that this expedient which, at the time, undoubtedly saved the situation, was only rendered possible by the American declaration of war. Even prior to 1917, our exports had shrunk, in 1915 to 57 per cent., and in 1916 to 63 per cent. of the import values—a direct result of the great diversion of labour and material to military purposes. The proportion

of exports shipped to the Allies had doubled; the proportion of imports derived from the United States had nearly doubled, before 1917. Further, the Allies themselves were drawing large supplies from the United States direct, partly on our credit. The result was that British credit in the United States had become exhausted. In order to maintain the exchanges, we had sold or pledged the pick of our American securities, and by the end of 1916 it was becoming exceedingly difficult for the Treasury to finance further purchases. By the early months of 1917 the provision of dollar credits had become an overpowering preoccupation. There was no likelihood of a sudden, catastrophic cessation of supplies; but it had become exceedingly doubtful how long British and Allied supplies could be drawn from America at the rate and in the volume that the war had already rendered necessary; and it was fast becoming evident that that volume must be considerably increased, if the available tonnage was to be rendered capable of fulfilling the demands upon it. It was only by the entry of America into the war that the problem was solved. With the United States as an Ally, it was possible to obtain large direct credits from the American Government, and by mortgaging the future to meet the immediate crisis. In other words, the assistance of the United States had become essential to enable Great Britain to fulfil her normal functions in the Alliance, by ensuring to the Allies those supplies of food, fuel, munitions, and materials, without which the gallantry of their armies must be exhibited in vain.

Thus, while the military assistance rendered by Great Britain to her Allies was beyond precedent and beyond expectation, the price of that assistance had to be paid not only by Great Britain herself, but by her Allies, in a great addition to the financial burden of the war, and in grave jeopardy to the maintenance of the minimum volume of supplies essential for war purposes.

CONCLUSIONS.

May I repeat that I have no wish either to make or to imply any criticism whatever on the conduct of the Great War. It would be improper for me to do so; for I have been considering only one aspect of a very complex problem that had to be solved, at the time, in the light of existing military and diplomatic conditions. Much more important, however, than criticism, is the use we are to make of our experience as a guide to future policy. I wish to avoid any appearance of dogmatism, and to guard against the inevitable bias that comes of specialised study, but I suggest that three things are clearly established:

First, that the importance of Maritime Power in war is greater than ever before, and increases in direct ratio with the extent and prolongation of the conflict.

Secondly, that the demands likely to be made on our economic and financial resources by Continental Allies are, for this reason, likely to be more extensive and more vital than even in past wars.

Thirdly, that our attempt in 1914-18 to combine the satisfaction of these demands with a vast expansion of our own military effort did, in fact, strain our resources beyond, or almost beyond, endurance, and jeopardised the fulfilment of requirements absolutely essential to our Allies themselves.

Beyond this, all is controversy. How far the conditions of 1914-18 are likely to be repeated in any future conflict in which we may unhappily be engaged; how far the strain could have been eased in the late war itself by the adoption of different methods of organisation—these are matters on which many different opinions will be formed. I think, however, that I am justified in suggesting to you, as a subject for discussion and investigation, the query which persistently haunts my own reflections on the events it has been my business to chronicle. That query is this:—

Is military effort on the largest scale compatible, for this country, with adequate fulfilment of the demands normally to be expected from Continental Allies?

However strong may be the hopes some of us entertain of avoiding, in the future, a new world-conflict, this question is of more than academic importance; for the answer we give to it will colour profoundly our attitude to all international engagements. If we answer it in the negative, if we consider that the double task is likely to be beyond our power, or to involve risks too serious to be accepted, then it is clear that both in framing foreign policy and in defining our actual commitments under Treaties of Alliance, Ententes, Defensive Pacts, Covenants, or Protocols, we must consider first of all our ability to perform those specialised functions that we shall certainly be called upon to fulfil. Any additional obligations must be confined within such limits as will permit the adequate performance of our primary task.

DISCUSSION.

REAR-ADMIRAL ADAIR: I rise because nobody else does, as I think it would be lamentable, after the splendid lecture which we have had, if nobody made any comments upon it. I wish to allude only to two small points. The lecturer referred to the necessity of maintaining exports to pay for imports, and the grave difficulty which we had in doing that during the War. I am going to give you a concrete example of something that was done in the direction of maintaining our exports. Our export of corsets to South America was a very valuable one. The manager of a certain corset factory was within the age for service with the Army, and he was exempted solely in order that we might go on exporting corsets to South America. They were of small bulk and sold at good prices, so that they were useful in both ways—occupying a small space in the ship and bringing back a large return in the shape of money. I merely give that as a concrete example. The other little point to which I wish to refer was the remark made by the lecturer that every man taken out of the country counted two on a division. That is not strictly correct, because the men taken out of the country were only within certain ages, and there were thousands, I may say millions, of men who had more or less retired or were, perhaps, in trades not useful

for producing articles which were necessary for the war who might usefully be diverted into the production of war material. There, again, I will give you a concrete example. Watch-makers beyond the age of serving at the front were most valuable, skilled men, and they were all taken for the production of those gauges which were used in the making of guns and projectiles. Though he did mention them later in his lecture, I do not think Mr. Fayle referred sufficiently to the women. There were in this country millions of women who were more or less at leisure or in some occupation not essential to the production of war material who could be brought in and who did come in—gentle and simple, all classes. Now, I speak from personal experience. The firm with which I have the honour to be employed at the end of the war 45,000 people, of whom I think 8,000 were women. Those women had never touched war material before, but they threw themselves into the breach and in less than no time they were doing better than the men in the production of, for example, small shells. We could not possibly have provided the number of shells required for the Army had it not been for the women. I am anxious to pay a tribute to them because I have never had an opportunity of doing so before in the presence of a "Service" audience. I will say this too, that the gentle folk were perhaps quicker at learning the job than the simple, though perhaps the simple had greater endurance owing to their previous training in hard work. But the variety of women that were employed in our shell shops was something extraordinary. They varied from ladies who lived in castles surrounded by parks, to the girls who served in fried fish shops, and they all put their backs into it in a way which put the men to shame. I am sorry to say it, but the Trade Union men and persons who are known as shop stewards and that class of men were most difficult to deal with. They were always seeking for higher wages. The women, on the contrary, were most anxious to do their work, and, in fact, I have seen a girl weeping because she could not learn how to turn a projectile. That brings me to another point which is, I am afraid, a little outside the scope of the lecture. It was the greatest pity, in my opinion, speaking as one associated with great works, that when we brought in conscription for the Army we did not bring in conscription for labour too. We brought in all these people to produce what in ordinary times was done by men. They were paid enormous wages; they cost enormous sums for being taught; there was a number of failures, though they were wonderful in the end; but if the Government had only had the pluck to bring in conscription for labour as well as conscription for the Army, much money would have been saved.

PAYMASTER-COMMANDER H. B. TUFFILL, R.N.R.: I venture to rise because I think the lecturer is entitled to a very hearty vote of thanks from us. He has opened up for us to-day a field of thought which I do not think has been explored or even mentioned in this theatre before. In previous lectures that have been delivered here we have heard of the various difficulties connected with Ocean-borne trade, Shipping, Tonnage and various other matters, but in this lecture Mr. Fayle has taken the matter a step further and has dealt with the economic value of Tonnage and of Import and Export Power. In the brief time of one hour he has given us a most interesting review of the delicacy of our whole international and intercommercial machinery. He has dealt with each cog in that wheel that revolves daily whether it be in peace or in war. We sit down to our breakfast and eat our food, but I am afraid we do not realise by what complex machinery delivery of that food to our table is ensured. It was during the late war that we found out which were the essential cogs, which were the

most important items. Many of them had hardly been considered before, but the lecturer has focussed our attention on them to-day.

If I may I should like to differ from what Admiral Adair has said in regard to the conscription of labour. Conscription from the Army point of view was undoubtedly very well worked out, but from what I saw of Labour—and I saw a good deal of it—I venture to think it would not have produced as good work as was obtained from the voluntary system in our factories, in our ports and all over the country—not only from women but from the men also. There is one aspect of labour that I should like to mention because the lecturer did not touch on it, although no doubt he is fully aware of it, and that is that in dealing with Man power, as it was called a few years back, it is essential that you should have A1 men to deal with heavy work. As an example of that, you cannot discharge iron ore out of a ship with what was then called C3 labour; you must have very fit and strong men to do it. In dealing with man power or labour, whichever term you like to use, it must be borne in mind that it must be distributed with due regard to the requirements of the community as a whole and what you are going to use it for. You cannot move a motor-car with the wheels of a watch, yet that is what was attempted in certain instances during the latter period of the late hostilities.

Mr. Fayle concluded his lecture with a query, which I venture to think he has really answered to a very great extent, for he has shown that without due regard to the economic fundamentals of commerce, man power, and, above all, tonnage, *i.e.*, ships adventuring freely on the world's seas without let or hindrance, military effort is not compatible with adequate fulfilment of the demand that may be expected from any Allies.

MAJOR-GENERAL SIR ERNEST SWINTON, K.B.E., C.B., D.S.O.: As an old soldier may I say how much my eyes have been opened and my mental horizon enlarged by the lecturer's lucid summary of the wide ramifications, direct and indirect, of the recent war, the nature of some of which have been a revelation to myself and—I expect—to many others present. Though our conception of war may not have been limited to fighting and operations alone, we could not have conceived—and no one could have conceived without the actual experience of war—what would be the inevitable effect of a world-wide struggle under modern conditions, when the threads of the commercial and economic lives of nations are so interwoven. I have followed the lecturer's interesting and illuminating discussion with great attention, and have learned much from it. But there are certain points which—speaking for myself—I do not fully understand. One, which occurs to me amongst others, refers to the very complex subject of credit and exchange, which is not a question with which fighting men are usually very familiar. Mr. Fayle mentioned as one of the remote but inevitable and important reactions of the war the necessity of supporting the dollar exchange. I should be glad if he would enlarge on this matter, remembering that he is an expert on the subject of international economics and finance and has been studying this side of war, and that most of us Service men present are quite unfamiliar with it. If he could still further enlighten our ignorance as to why and how the need for supporting the dollar exchange was caused, and how it was done, many of us present to-night will be grateful.

Mr. C. E. FAYLE (in reply): Ladies and Gentlemen, I have to thank you for the extremely kind reception you have given me, and I have also to thank the speakers for their kind remarks, which I feel are beyond my deserts. I do not think there is very much for me to answer. Admiral Adair is certainly correct in

saying that, verbally at any rate, I overstated the case in saying that *every* man taken into the fighting line involved a diversion from productive power, but the exaggeration is small. I did refer to the fact that a large part of the workers absorbed into the Army were replaced, mostly by women, by juveniles and by men newly brought into employment; but in very many of the industries, and some of the most vital, that made the labour position extremely dangerous. In trades like shipbuilding, to take one instance, and in all the munition industries, you must have a sufficient nucleus of highly-skilled men if the unskilled labour is to be able to work to full effect. I must not follow Admiral Adair into the question of the conscription of labour, because that would take me rather outside my subject of this afternoon, and Paymaster-Commander Tuffill has said for me what I should have said myself. The point which Paymaster-Commander Tuffill raised, and on which I know he spoke with great knowledge and experience, as to the importance of physically fit men for dock work, is one that has been very much brought home to me. The congestion of the ports, which caused such a serious reduction in the carrying power of the ships, was very largely due to the fact that so many of the strongest workers had gone to the front. Then the Port and Transit Executive Committee devised a scheme for creating the Transport Workers' Battalions, who were men enlisted for home defence, and who were rendered available for work in the docks at times of acute congestion. To go through the correspondence relating to the Transport Workers' Battalions and to see how there were given to this work of unloading iron ore and other heavy goods, all the weeds that could be collected, is a most remarkable thing. They did get the right men ultimately, but they had to fight extremely hard for them. It was, however, a matter of the utmost importance, because it was imperative that every ship should be turned round quickly if the Army was to get adequate supplies of munitions. I think that General Swinton has rather mixed up two things that I said. I said that we had sold the pick of our American securities to keep up the American exchange, and I said that the supply of dollar credits was necessary. I did not say that we had to support dollar credits. By dollar credits one simply means credits in America. The point was simply this, that from the very beginning of the war, for one reason or another—it began with the failure of the Australian wheat harvest in 1915—we had to bring over more and more imports from North America, and we had not the wherewithall to pay for them, because America did not take our exports to a very large extent. The triangle of exports from England to India, and from India to America, which is one way by which we balance the exchanges in times of peace, broke down through the diversion of tonnage. We were piling up immense debts in America. I know from the very highest authority that at the beginning of 1917, or even at the end of 1916, the Treasury were literally at their wits' end to get American shippers to trust us any more, and it was not until the American Government came in and backed our bills that we were able to be certain of the supplies which were vital to ourselves and also to our Allies.

THE CHAIRMAN (Vice-Admiral Sir George P. W. Hope, K.C.B., K.C.M.G.): Ladies and Gentlemen, at the beginning of his remarks Mr. Fayle said that he was only dealing with one aspect of the subject under discussion. As we have seen during the course of his remarks, that one aspect covers a larger extent of ground than one can deal with in an afternoon's discussion of this sort. He has brought out most clearly the stupendous part played by this country in the late struggle in so many of the various factors that figure in an unlimited war of to-day. He finished up by giving us a query. I venture to say that that query

is not a new one. In all our Continental wars, certainly for the last three centuries, it is one that our statesmen have had to face, of course in varying degrees. So far as I can see, that query has never yet been answered satisfactorily, at least not to everybody's satisfaction. There have always been different schools of thought on the matter, each advocating their own scheme and their own ideas. One school perhaps has advocated military effort in conjunction with our Allies on the Continent, combined with naval effort at sea. Another school has proposed Colonial and other military expeditions combined with naval effort and financial assistance to our Allies, and there was even another school which said we should confine ourselves to the sea alone and financial support to our Allies. The fact is, of course, that the answer depends on so many factors, so many conditions, political and military, the nature of the war and the national object of the war, that I venture to say no hard-and-fast-rule can possibly be laid down which would satisfy all requirements. We have learned a great many lessons from the war, and I do not think there is any of greater importance to us than what we have been hearing to-day—that is, the greatly increased dependence of a nation at war on the maintenance of commerce and of industry of all descriptions, and it is that greatly increased dependence which makes the question to be answered still more complicated.

I will not detain you any longer this afternoon or attempt to answer the query myself. I will simply ask you to give Mr. Fayle a very hearty vote of thanks for his most valuable, interesting and instructive paper.

The resolution of thanks was carried with acclamation.

DEFENCE OF OUR MERCHANT SHIPS IN A FUTURE WAR.

By CAPTAIN FREDERIC E. STOREY, R.D., R.N.R.

IN the various Service publications for the past several years much has been written about the future of the fighting Services on land and sea, and in the air, but little attention seems to be paid to the defence of our merchant ships in another war. Before going deeper into this subject, I would remind the reader that the fighting Services depend entirely upon these ships for their maintenance in consumable stores and for sea transport of every description.

One of the greatest lessons potential enemies can have learnt from the history of the last war is that a speedy destruction of our merchant ships would ensure victory over the British Empire. Unlike the main fighting fleet of the Royal Navy, Merchant ships must keep the seas, day after day, in order to maintain both the civil population and the fighting forces.

In view of the great advance of air warfare the system of convoys at sea, as practised in the late war, will have to be improved upon. The offensively armed escort will, in fact, have to be able to meet air attacks in addition to fighting surface and underwater craft. Merchant ships, too, will have to be able to defend themselves against (a) Underwater attack, (b) Aerial attack, (c) Gas attack. It is also suggested that they should be trained to combine and act together so as to make full use of their limited primary armament against a single raider. The three or four simple formations required to place the ships in such order as to bring their most effective fire to bear on the enemy could be learned by any Mariner in a few hours.

The young officers who were watchkeepers in our convoys in 1916-18 will most probably be Ship Masters in the next war, so that the art of handling ships in unison and station-keeping will no longer be looked upon as a sort of black magic.

The Masters and Mates of our Merchant ships should be taught in peace how to prepare their ships for time of war. The measures to be taken should be included in the curriculum of the Marine schools and training establishments in general.

If officers were trained in this way there would be less danger of a repetition of many regrettable losses which occurred in 1914-18.

The Board of Trade could issue printed Instructions to the Local Marine Board, who in turn could inform the Navigation Schools at the various ports; thus the aspirants for a Board of Trade certificate would have at least a working knowledge of how to safeguard their ships in wartime.

With regard to the use of the defensive armament of Merchant ships, I have before me a letter, written in September, 1913, dealing with the subject of training Merchant Service officers in the use of light guns (3-pdr. to 6-inch). In the letter it was suggested to make the Board of Trade certificate provisional until the Officer had qualified in elementary gunnery knowledge. The Treasury was, I think, the stumbling-block, and nothing happened until the war came—in fact, till 1915 and onwards. The result was Merchant ships were manned by a few half-trained gunlayers and breach-workers, and the other members of the gun's crew were picked up from the ship's *personnel*, who probably had never seen the type of gun they were called upon to work, and yet might have to deal with an enemy within four hours of clearing the dock gates.

The training of Officers in the use of Merchant ships' armaments should not be neglected in peace-time. It could be of a voluntary nature and might be carried out by the Instructors of the Royal Naval Volunteer Reserve who are stationed in all our great ports.

Shipping Companies would, I think, co-operate in the scheme by giving preference to the young men who are in possession of certificates of knowledge of armaments by sending them to defensively armed ships.

Turning to questions of *matériel*, in order to provide for future contingencies, before the perils of war are upon us, I suggest the following should be done:—

- (i) Give all Merchant ships of from 2,500 to 6,000 tons net one anti-aircraft gun; this gun to be so mounted that it could be used either for high angle or as part of the ship's ordinary armament, to which it should be an addition.
- (ii) Ships of over 6,000 tons net to have an additional armament of two H.A. guns similarly mounted.
- (iii) Gas masks to be supplied to every member of all Merchant ships' complements.

With regard to the latter, the obsolete pattern of gas mask could be used for the protection of Mercantile *personnel*, with the exception of the people who are called upon to perform hard physical labour on the upper deck, or in the stokehold of coal-burning ships. For the latter the improved pattern is necessary, as men cannot do heavy work efficiently in the older pattern of mask.

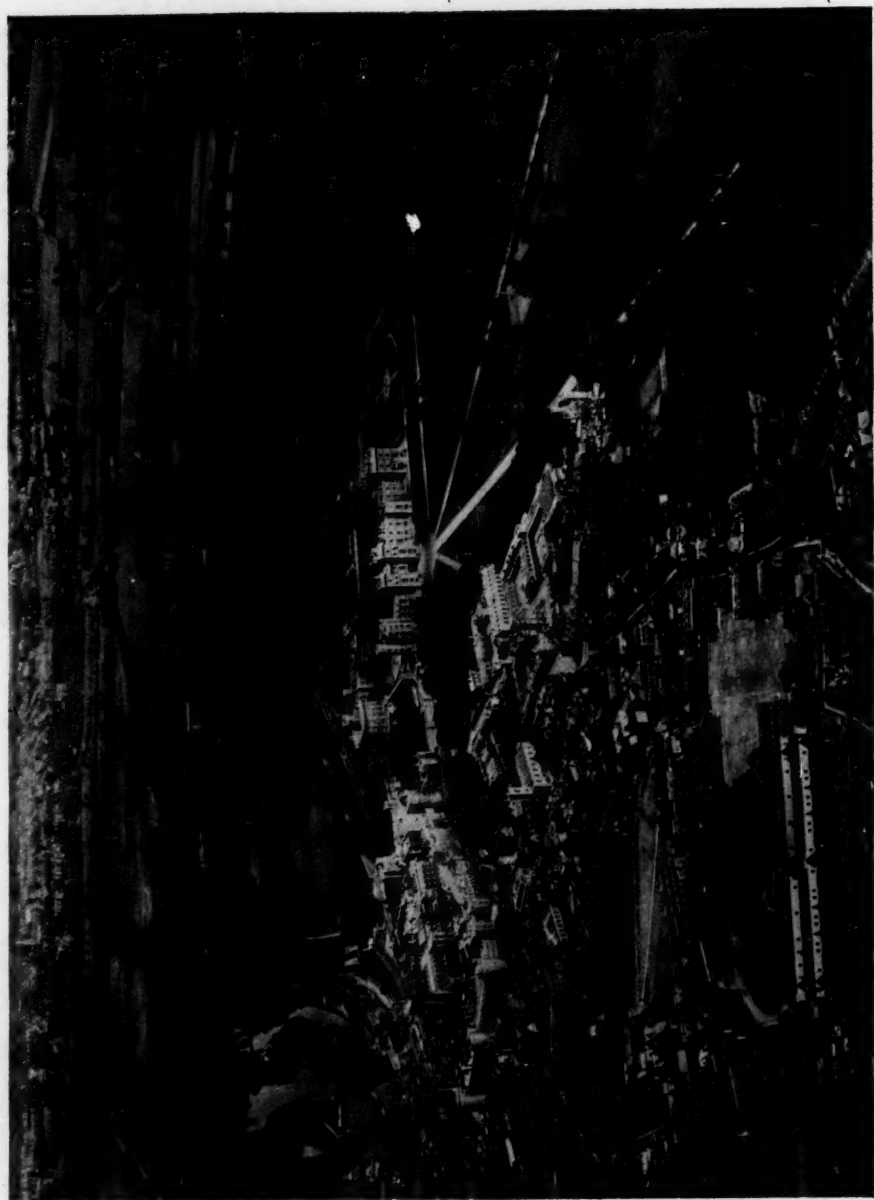
The care and maintenance of anti-gas equipment for the Mercantile Marine in peace-time is a subject which calls for the close co-operation of the Admiralty and the Shipping Companies throughout the Empire.

It is a bold man who will say gas attack at sea from aircraft is a most unlikely method of attacking our Merchant shipping. In the opinion of the present writer the day is near when chemists and research workers will produce a gas which can be controlled and regulated according to the barometer and thermometer readings.

It is not unlikely that, within the next decade, it will be possible for an enemy to spread a high concentration of gas at a selected level above the water and distributed over, perhaps, ten square miles of sea.

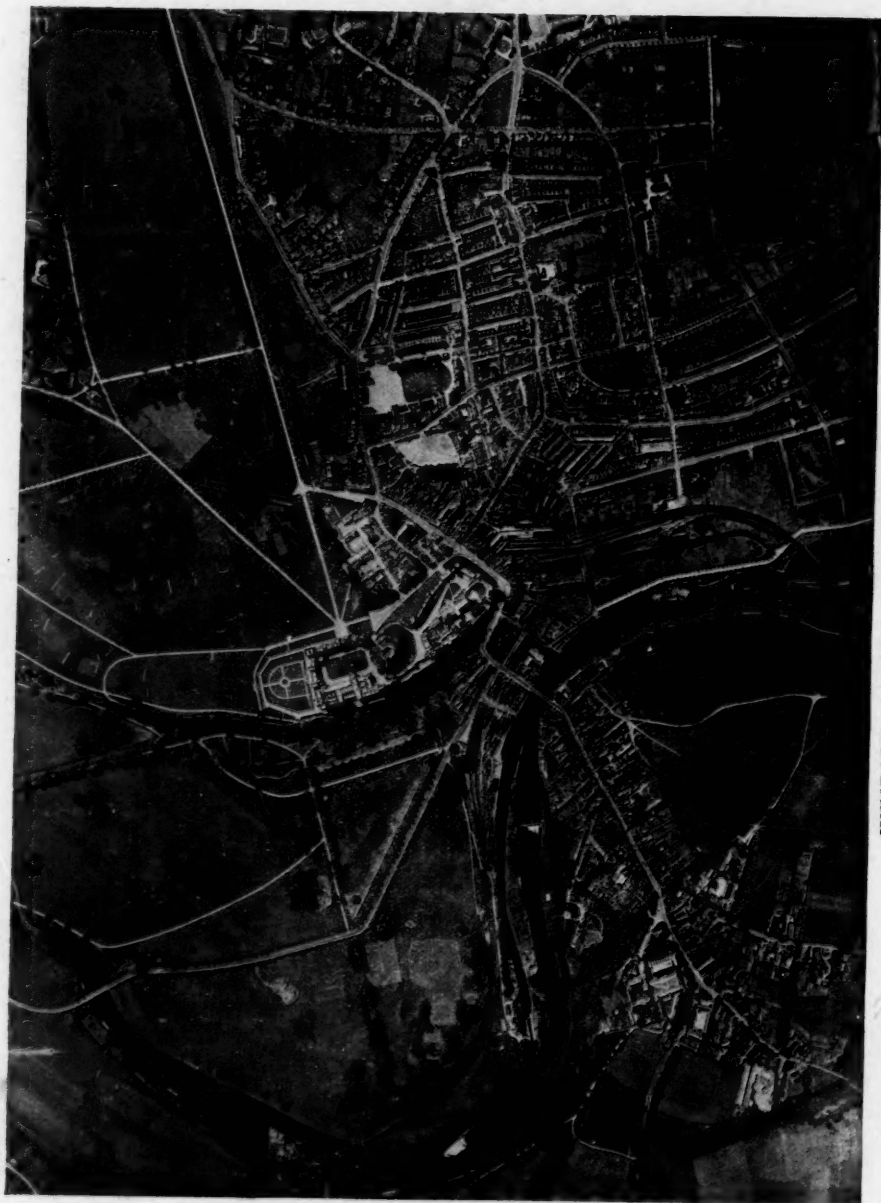
A convoy harrassed on both flanks by a flight of aircraft may be driven into this infected area, when an untrained and unprotected crew will soon be out of action. On the other hand, a ship which is manned and armed with trained men and more or less adequate weapons of offence and defence could at least have more than an equal chance of destroying (not merely evading) the enemy.

Up to a hundred and twenty years ago, all merchant ships were, for their day, well armed and able to look after themselves. It would be well if we reverted to the practice of our forebears in this respect and placed our "common carriers," upon whom the existence of our Empire depends in peace and war, in a position to defend themselves against the enemy. At present we are being lulled into a false sense of security by writers of pretty poems about the sea and pacifists who talk of there being no more war, until we shall find, when the time comes, that our Merchant ships are just about as capable of defending themselves against these new forms of attack as sitting ducks on a Norfolk Broad are against the punt gunner.



WINDSOR CASTLE, OBLIQUE VIEW.

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WINDSOR CASTLE, VERTICAL VIEW.

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THE INTERPRETATION OF AERIAL PHOTOGRAPHS.

By MAJOR G. J. V. SHEPHERD, D.S.O.

BEFORE the late war, aeroplane photography had been a subject little considered from either a military or civil point of view. Attempts were made in France as far back as 1856, to take photographs from balloons. The results obtained were exceedingly poor, chiefly owing to the fact that the dry plate process had not at that time been invented, and a balloon is hardly an ideal spot for wet-plate photography.

The attempt was renewed in 1885, receiving further stimulus in the China Expedition of 1900 and in the Russo-Japanese War. In 1909, the first photograph was taken from an aeroplane. At that period, however, research appears to have been concentrated on the evolution of the aeroplane itself; aeroplane photography was shelved as a side issue till a more convenient period, and the war found all nations unprepared for the enormous demand made for air photographs. *Personnel* were untrained, cameras ill-suited to the new and peculiar conditions, while the question of the camera mounting, from the point of view of neutralising vibration, had not been considered.

The first photographs obtained proved their value, crude though they were, and the subsequent demand from the Intelligence Branch of the General Staff acted as a stimulus, to which response was quickly made.

A vertical aeroplane photograph presents objects on the ground in a somewhat unfamiliar guise to the uninitiated. Consequently, during the earlier stages of the war, the study of these photographs was viewed in the nature of a technical science and was little considered outside the spheres of the Survey and Intelligence organisations. As with all fresh subjects, however, familiarity bred, not contempt, but a greater understanding. By the end of the war, photographs were being issued on a large scale to the regimental officer, and freely examined by him. He soon discovered that little was required as an aid to interpretation beyond an elementary knowledge of shadow effect and a modicum of common sense.

The photographs themselves are classified under two main heads—the *oblique* and the *vertical*, other types being merely an elaboration of these two. An example of each type is shown in Plates 1 and 2.

At the beginning of the war the oblique was the only form considered, the value of the vertical not being discovered till later. It may be as well here to consider briefly the merits and disadvantages of these types. The following are a few considerations:—

- (a) The vertical enables the examiner to study objects hidden from the observer on the ground by topographical and artificial

features. The oblique suffers from the same disability in this respect as the ground observer.

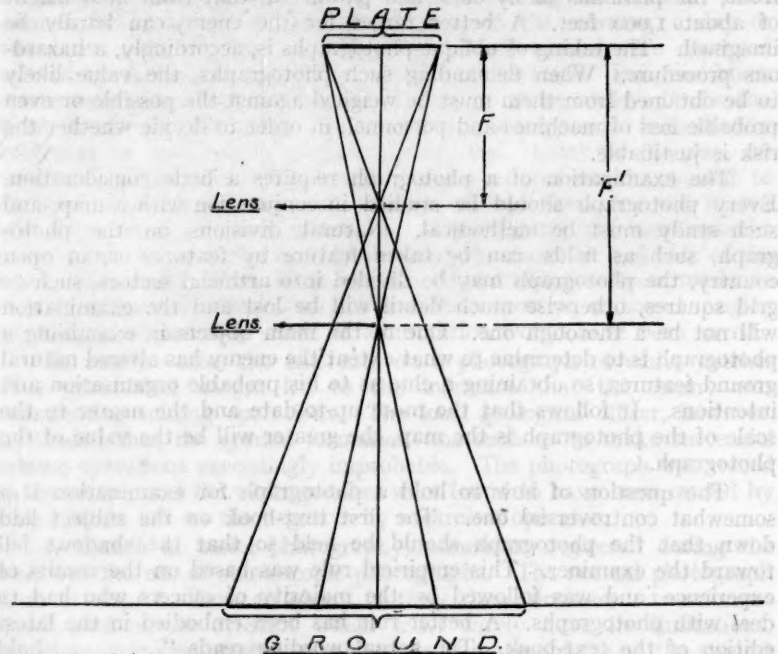
- (b) The vertical and the map, being analogous, are easily studied in comparison.
- (c) The vertical, which suffers from little distortion, can be used for plotting detail. The oblique, which may be considered as a grossly distorted vertical, is useless for this purpose except in the hands of the expert cartographer.
- (d) Good vertical photographs can be obtained from almost any height within reason, though in this country it is rarely possible to obtain photographs from an altitude greater than 15,000 feet owing to bad weather and atmospheric conditions. The height at which an oblique is taken is comparatively limited. (This point will be considered later.)
- (e) Other conditions being equal, the oblique covers a far greater area of ground than the vertical. In an oblique, however, the background is so indistinct as to be comparatively valueless.
- (f) The vertical is unfamiliar to the eye of the novice. The oblique, on the other hand, has the appearance of a panorama. Objects appear much the same as to a ground observer and are easily recognisable.

There is, accordingly, a good deal to be said for and against each type of photograph. The writer having studied the subject to a great extent from a purely Intelligence view-point, is somewhat biased in favour of the vertical. On the other hand, oblique photographs in large numbers were issued to the troops in the closing stages of the war, and were found of considerable value to all ranks in studying the nature and appearance of the ground over which operations were contemplated. In addition, oblique photographs of any large obstacle, such as a canal or river crossing, are of undoubted value to the engineer. Broadly speaking, the vertical is the better guide to the doings of the enemy, the oblique a greater aid to a study of the country.

Each has, therefore, its own use. In the great majority of cases, the best results will be obtained from an examination of both types of the same area, if obtainable. This is especially the case in mountainous country, where the accidents of the ground are more clearly shown in the oblique, whereas the vertical is essential for detailed examination.

An important question to consider is that of the scale of the photograph. The camera used in aerial photography can be fitted, by a simple adjustment, with lenses of varying focal lengths. A glance at the following diagram will show that, at a constant height, a camera, using a lens of focal length F , will cover a greater area on the ground than when using a focal length F' . In other words, at a given height, the scale of the photograph will increase with the focal length of the lens. Conversely, photographs of similar scale can be produced by machines at various heights using different lenses. As an example, cameras photographing at 6,000 feet with an 8 in. lens, or 15,000 feet

with a 20 in. lens, each produce results on a scale of 1 over 9000. Scale can, of course, be adjusted in the enlarging camera. But a photograph taken with a 4 in. lens and subsequently enlarged, does not give the



same detail as a large scale photograph taken with a lens of longer focal length. The grain of the plate becomes noticeable on an enlargement and interferes with the information contained upon it.

It follows that, since the airman can juggle with his height and lens to produce the required result, he can in fairness be asked to obtain a large scale photograph without running any undue risk from enemy ground action. In every case, however, a definite demand should be made. The required scale should be stated or, alternatively, the object for which the photograph is desired. The photographer can then work out the lens and flying height most suitable to the prevailing conditions of weather and enemy action. It should be borne in mind that this point is as important in peace training as in war.

The foregoing applies to vertical photographs only. The oblique is taken under very different conditions. At the present moment, the service pattern camera, fixed to the machine, is unsuitable for oblique work without the addition of prisms or reflectors. This is carried out by a hand camera, held by the observer looking over the side of the fuselage. The hand-held camera has a lens of fixed focal length (10 in.)

and good results cannot be obtained at heights greater than from 1,000 feet to 1,500 feet. The former is the better figure. Under these conditions, in order to obtain a series of obliques along any particular front, the pilot has to fly close and parallel to that front at a height of about 1,000 feet. A better target for the enemy can hardly be imagined. The taking of oblique photographs is, accordingly, a hazardous procedure. When demanding such photographs, the value likely to be obtained from them must be weighed against the possible or even probable loss of machines and personnel, in order to decide whether the risk is justifiable.

The examination of a photograph requires a little consideration. Every photograph should be studied in conjunction with a map, and such study must be methodical. Natural divisions on the photograph, such as fields, can be taken feature by feature, or, in open country, the photograph may be divided into artificial sectors, such as grid squares, otherwise much detail will be lost and the examination will not be a thorough one. One of the main objects in examining a photograph is to determine to what extent the enemy has altered natural ground features, so obtaining a clue as to his probable organisation and intentions. It follows that the more up-to-date and the nearer to the scale of the photograph is the map, the greater will be the value of the photograph.

The question of how to hold a photograph for examination is a somewhat controversial one. The first text-book on the subject laid down that the photograph should be held so that the shadows fell toward the examiner. This empirical rule was based on the results of experience, and was followed by the majority of officers who had to deal with photographs. A better rule has been embodied in the latest edition of the text-book. The actual wording reads " hold the photograph in such a position that the light, artificial or natural, by which you are working, falls from the same direction on the photograph as the sunlight did on the ground at the moment of exposure." This rule is based on common sense, as it is unnatural for a shadow to fall towards the light. It will be seen at once that the old rule was the special and usual case of examination with the window or light facing the examiner. The importance of what would appear to be a somewhat immaterial question lies in the fact that photographs give very different impressions according to the way in which they are held. If held the wrong way, embankments appear as cuttings, excavations as mounds. The psychological element also enters into the question. If the photograph is held incorrectly in the first instance, the false impression conveyed will be difficult to eradicate.

In the reading of photographs generally, the examiner should never forget that the photograph is but one link in the intelligence chain. There is always a grave danger that the expert examiner may become inclined to rely on the photograph alone and neglect outside sources of information. One or two illustrations of this fact, taken from the late

war, may well be quoted here. In one case a hostile battery had been located beneath four trees in a hedge running approximately North and South. It was subjected to destructive fire, and for some weeks subsequently showed every evidence of being abandoned. Then came a fall of snow. A photograph taken in the morning, a day or two later, excited great interest. Four black marks were observed west of the hedge, obviously the shadows of the trees. But four black marks were also observed east of the hedge; these could only be the blast marks of the guns. The supposed battery was immediately subjected to very heavy counter-battery fire. Later in the day, an observant officer noticed that bare patches existed on the ground to the east of all trees in his own locality. It was then observed that a stiff, warm west wind had sprung up. The dripping moisture from the trees, blown towards the east, had eroded the snow on that side of the trees. Hence the false blast marks. Had reference been made to outside sources of information, such as flash spotting or sound ranging sections, much needless waste of ammunition would have been saved.

In another case, the existence on a photograph of white patches of a granulated nature led to the inference that the enemy was commencing mining operations. The local geological officer, however, contended that the ground formation was such as to make successful mining operations exceedingly improbable. The photograph was traced to its source, and the white patches were found to have been caused by finger prints left on the negative by a careless operator.

A branch of aerial photography, somewhat neglected during the war, was the use of stereoscopic photographs. The normal photograph is an attempt to show an object of three dimensions on a two-dimensional surface, an attempt which must surely have its limitations. A stereoscopic pair of photographs tends to make objects on the ground appear in relief, as in nature. In addition to objects of artificial formation, such as quarries, cuttings, embankments and shell-holes, topographical features appear in relief and can be recognised. The writer has in mind a photograph of a small wood, consisting chiefly of low scrub, so dense as to evade all shadow effect. The impression conveyed was one of a uniformly flat surface. Under stereoscopic examination a decided dip in the ground was revealed, capable of concealing a number of men. No trace of such a depression was apparent on the map, the limits of height and depth lying between two contours at the vertical interval employed. Intelligence of this description is naturally of vital interest to regimental officers. The normal pattern stereoscope is a comparatively cumbersome instrument. It also involves the use of specially prepared pairs, cut out and mounted on cardboard, the originals being mutilated and rendered unsuitable for subsequent reference or any other purpose. Further, it appears to be a somewhat general impression that a good stereoscopic pair must consist of consecutive photographs taken by the same camera. Under such conditions, the scope of stereoscopic work below the higher

formations is limited. But there is no need for these conditions to be binding. Taking each in turn, we find that :—

- (a) A pocket stereoscope which can be carried in the breast pocket already exists. The present pattern has certain disadvantages, capable of remedy by minor mechanical alterations not affecting its portability.
- (b) With the pocket stereoscope, a pair of photographs can be examined in detail on the table, without mutilation. No appliances or material are required for mounting, and the photographs can subsequently be filed for future reference.
- (c) Subject to certain conditions, a stereoscopic pair may consist of photographs taken by different machines on different dates. Such photographs must, however, be of approximately the same scale, and taken under similar conditions of light. Obviously also, the object photographed should not have changed its appearance in the interim. As the need of the regimental officer is under consideration, the question of returning a pair of photographs, of different scale but otherwise suitable, to the photographic section for the necessary enlargement or reduction, has not been considered, the extra work and delay involved being obvious. The arrangement of a pair of photographs in correct juxtaposition for examination, and the use of the pocket stereoscope, can be easily acquired with half-an-hour's instruction and practice.

Stereoscopic obliques are of equal value to stereoscopic verticals as an aid to visualising the nature of country and folds in the ground over which an advance is in prospect. It is, however, far harder to obtain a good stereoscopic oblique, owing to the greater depth of subject involved and the rapidity with which the foreground changes in relation to the background. For this purpose it is necessary to take photographs at a lesser time interval than the present oblique camera allows. The normal method employed is to take one photograph, endeavouring to take a second from approximately the same position on a second run, demanding a high degree of skill on the part of both pilot and observer. Good results, however, justify any difficulties encountered and overcome. In conclusion, it may be stated that the stereoscope is not a toy, and, with intelligent use, is of inestimable value.

During the war 1914-18, the interpretation of aerial photographs developed under distinctly special conditions. By the time photographs came into general use, the position on the Western Front had stabilised, and remained so until the final weeks of the war. As a consequence, the majority of text-books and treatises dealing with the subject treat with trenches and wire, the appearance of shell-holes, trench mortar positions and listening posts, and the characteristics of dug-outs and emplaced battery positions. In the opening stages of moving warfare, leading up to and including what is known as "the encounter battle," few of these will appear and the student is rather at a loss to appre-

ciate the value to be obtained from photographs under these conditions, and to determine the point from which the subject may be approached. Until one side or the other is forced to make a stand, and to resort to the pick and shovel, little disturbance to the ground will result. And it is to the disturbance of natural ground features that the student of the photograph has learnt to apply himself. Without any previous experience or practical grounds to go upon it is only possible to theorise. Apart from rear organisations and until entrenching is resorted to, little evidence of enemy occupation or organisation will be found beyond fresh tracks and the wear and tear of the ground. Tracks, both of men and vehicles, invisible on the ground, appear on an aerial photograph to an astonishing extent. Tracks visible on the ground are virtually impossible to conceal. Some of the features revealed by tracks are :—

- (a) Important centres, such as H.Q. and Signal Centres.
- (b) Artillery Observation Posts.
- (c) Battery and Machine Gun Positions.
- (d) Supply and Ammunition Centres.
- (e) Billeting Areas.
- (f) Railheads, assisted by activity in new rail construction.
- (g) The presence of tanks and tractor vehicles.

Owing to the nature and extent of tracks, camouflage is impracticable. The simulation of false tracks is a long and wearisome business; in the stress of moving warfare, it is doubtful whether labour and material would be available for the purpose. What is the answer to the conundrum?

The only answer would appear to be :—

- (a) The careful siting of all works and positions, with a view to evading the necessity of creating fresh tracks, or of allowing such tracks to be formed in natural cover, such as under trees, in the shadow of hedges or in ditches.
- (b) To coin a new phrase, the insistence on strict "track discipline."

Human nature being what it is, the inclination to take the shortest line across country to one's objective is hard to combat. Still more so is this the case with the orderly or runner, to whose untrained intelligence the necessity for track concealment is not obvious. The question is a difficult one, and cannot be solved by the provision of notice boards or additional unit police. There is little time for the one, and insufficient *personnel* for the other. The reply lies in training. There was a time when march discipline was unknown. It is now an accepted necessity. If the question of "track discipline" were taken up (backed by the regimental officer) the difficulties encountered by the student of aerial photography in moving warfare would be trebled.

We now come to a very important question. It fell to the writer during a period of training, to write an appreciation for a certain eminent officer. The resulting criticism was not wholly unfavourable, but ended with the words, "... but you have made no mention of

time and space." Let the error not be repeated. The question is:—How soon after a demand for photographs has been made may receipt of the photographs be expected? No definite answer can be given, being dependent, as it is, on variable conditions. It will be as well, in the first instance to consider the apparatus at present available. The old camera took photographs on a glass negative, size 5 in. by 4 in., from which it was necessary to issue prints enlarged to whole plate, viz., 8½ in. by 6½ in. In addition, certain data, such as the north point, registration number, height of machine, clock time of exposure, etc., had to be engraved by hand on the plate, subsequent to development and prior to printing. This took time. The new camera shows an improvement. A magazine is provided containing spools of 50 or 100 films, which can be automatically exposed without recharging. The requisite data is also automatically photographed on each film at the time of exposure and consists of the height, clock time, registration number, date, focal length of lens, and transverse levels for giving the approximate tilt both in the direction and at right angles to the line of flight. It is not intended, anyhow at present, to provide the north point, which can be gauged with sufficient accuracy from the time of exposure and the direction of shadows.

Other considerations include the size of the formation requiring the photographs (governing the number of reproductions required), the distance of the Co-operation Squadron from the Front, and weather conditions. It will be as well to take a hypothetical case. Assume a Squadron operating from an aerodrome situated 20 miles behind the line. A Corps requires a photographic reconnaissance of an area over which an advance is intended the following day. A machine flying at 8,000 feet with a 10 in. lens will produce photographs on a scale of 1/9,600, a suitable scale. Using a spool of 100 films, and allowing for a 55 per cent. longitudinal and 30 per cent. lateral overlap, an area of ground of roughly 5½ miles by 7½ miles will be covered on this scale.

One spool should, therefore, be sufficient for the purpose. With a smaller factor of safety, using less overlap, a far larger area could be covered.

Now as regards the time element. Assuming that machines are standing by on the aerodrome, the following would be an *approximate* time schedule:—

Receipt of request for photographs	8.00 hrs.
Machine leaves ground	8.20 hrs.
Machine returns to aerodrome (allowing for interference by clouds and enemy action)	10.20 hrs.
Spool received in dark room	10.30 hrs.
Developing, fixing, washing, drying, and printing one copy of each	13.30 hrs.
Receipt at Corps Headquarters	14.00 hrs.
Total time	6 hours.

To this should be added time required for distribution to lower formations and units, together with the time required for the reproduction of additional copies of the films. The latter may be estimated at 250 copies per hour. Thus 600 prints, or 6 copies of each photograph could be produced in a total of 8 hours. If enlargements are required, 25 per cent. should be added to the time of actual reproduction.

It should be borne in mind, however, that the only period which can be relied on for any degree of consistency is that involved between the time of return of the photographic machine to the aerodrome and the receipt of the photographs at the Corps. The time occupied between the machine leaving the ground and returning to the aerodrome is subject to so many variable factors as to be capable of only the broadest approximation.

Unfortunately, bad weather conditions militated against lessons of value in aerial photography being obtained during the Aldershot manoeuvres in September of last year. The time factor, however, worked out in approximate agreement with the foregoing figures. On the only occasion on which photographs could be taken, the machine left the ground at 10.35 a.m. One print of each photograph reached the Branch Intelligence Office at 1.0 p.m., but:—

- (a) The landing ground and photographic section were within 100 yards of the offices occupied by G.H.Q. and within 8 miles of the area to be photographed.
- (b) The prints were first copies and not fully dry.
- (c) The photographs were taken by the B.M. (or plate) camera, some dozen plates only being exposed, the machine returning immediately on completion of the task.
- (d) No other work of a photographic nature was in hand.

The situation since the exposure of the plates had changed considerably, and the photographs afforded only confirmatory evidence of the R.A.F. reports handed in some two hours previously. The logical conclusion would appear to be that, until a period in warfare has been reached where the situation has been stabilised for upwards of from 8 to 10 hours, photographs of forward areas will be of little value.

As a result, photography during the periods of movements will normally be restricted to obtaining information concerning movements of troops and transport by road and rail in back areas, and enemy rear organisation in general.

In conclusion, interpretation is not a difficult subject; but it contains many pitfalls for the unwary and, like everything else in this world, lack of practice blunts one's finer perceptions. Aeroplane photography has made rapid strides since 1918, and continues to do so. The finished product is getting ever nearer to perfection, while the practical use of the photograph is being enhanced by methods of more rapid production and distribution. If full use is to be made of this increasingly valuable source of intelligence at the *outset* of the next war, all ranks should be given the opportunity in peace of familiarising themselves with the subject.

THE SITUATION IN THE PACIFIC.

By MAJOR K. B. FERGUSON, R.G.A. (Retd.).

On Wednesday, 21st January, 1925, at 3 p.m.

ADMIRAL SIR R. G. O. TUPPER, G.B.E., K.C.B., C.V.O.
(Chairman of the Council), in the Chair.

THE CHAIRMAN: Ladies and Gentlemen, We are here to-day to listen to a very interesting lecture on the subject of "The Situation in the Pacific." The lecture has been prepared by Major Ferguson, who has made a considerable study of this very important subject. Everyone has read in the newspapers the controversy about the Singapore Docks, and the policy of whether we shall have those Singapore Docks or not bears very much upon the question of the situation in the Pacific. I will now ask Major Ferguson to give his lecture.

LECTURE.

THE problems of the Pacific are the problems of half the globe. On the circumference of this huge Ocean are China, Japan, Siberia, Canada, the United States, Mexico, the Central American States with the Panama Canal, Colombia, Ecuador, Peru, Chile, New Zealand, Australia. In addition to these independent States are a multitude of Dependencies, islands, archipelagoes, varying in size and importance from French Indo-China, the Philippine Islands, Borneo, Java, and Sumatra, to little coral atolls like Pitcairn Island that stand like oases in a desert of waters. The Pacific Ocean extends from Arctic regions off Alaska to the Antarctic waters of Ross Sea; and two of the States alone, China and the United States, include between them one-third of the human race. It is vast in size, and full of fascination. Since it first became known to Europeans, it has appealed to the imagination of travellers and adventurers; it now appeals also to students of politics, because it is the scene of international interests that are becoming more momentous every year.

In a short study to-day, we can only lay stress upon one or two points out of scores that offer themselves. I shall first take a glance from the Japanese point of view. Then I shall turn to the American point of view. Thirdly, I shall emphasise the importance of China. Finally, I hope to bring out the lesson which it seems to me *all* political problems teach us: the need to consolidate our own Empire, so that in strengthening itself, it may become a strength and stay to others.

I

Japan has a strong strategical position in the Pacific, and she has improved the advantage by raising herself to a high pitch of efficiency, both on land and at sea. But she has two difficult problems before her; one is, an outlet for her population, which is growing rapidly; the other is the problem of external supplies in time of war.

(1) The population of Japan proper is roughly 56 million; including Korea, Formosa, and Saghalien, it is roughly 77 million. It increases in Japan at the rate of about 600,000 a year, and that country is already closely packed. It is not so dense per square mile as ours in England; but whereas we have many of the fairest and most fertile portions of the globe to go to—Canada, Australia, New Zealand, Africa, the Colonies and Protectorates—the Japanese have at present only Korea, Formosa, and one half of Saghalien, no one of which offers much scope to an ambitious and enterprising people. Canada, the United States, Australia and New Zealand have closed, or are closing, their doors to the Japanese. They would find space enough, and to spare, in Manchuria and Siberia; but Russia is beginning to show signs of returning to the old Muscovite policy which we associate with the Tsarist *régime*, and will probably close Siberia to the Japanese unless they are prepared to fight for it, which is out of the question.

No man can foresee what way Japan will find out of her difficulty, and I wish purposely to avoid wasting time in speculation about the future. We can only note the broad fact that an expanding population must go *somewhere*, and the other broad fact that all the obvious outlets are closed. A rising flood must find an outlet or produce a catastrophe. We know what happened in our own country. England developed slowly in the 1500's, 1600's, and 1700's. Then, with the dawn of the Industrial Age, she went forward rapidly, and during the last half-century we have been living in a whirl of motor-cars, wireless, American "pop.," democracy, and emancipated women. So it is with Japan. It has been estimated that during the 230 odd years that she shut herself off from the world, roughly from the time of Charles I. to the middle of Queen Victoria's reign, her population only increased by some 26 million. During the last sixty years, on the other hand, the rise of Japan has been meteoric and bewildering; and if she goes on at the same rate, it is evident that her surplus population must find some place to go to. So much for her first problem.

(2) Her second problem concerns her supplies in time of war. Like Great Britain, she is dependent on external sources; she can never again be self-supporting. A hundred years ago, the Japanese cultivated their rice fields, and lived on the produce thereof; rice and fish were their staple food, they were a self-centred and self-supporting community. Then they suddenly flung their doors open and became a World-Power. They wanted ships and commerce, iron works and coal; that constant flow of raw material, of exports and imports, that an industrial nation demands. But Japan has no more acreage now than

she had a hundred years ago, and the Law of Diminishing Returns does not forget to act. So she has to get raw materials and foodstuffs from abroad, in the same way as we do ourselves. The Government are making strenuous efforts to increase the productivity of the land, chiefly in the output of rice, so as to make the country self-supporting again. But the tendencies are against it. The Japanese, for instance, are eating increasing quantities of meat, and wanting an improved standard of living, with more luxury and comfort; and as this tendency becomes more marked every year, Japan will depend more and more on foreign trade. Therein lies a danger, which the efforts of the most peaceful-minded statesman cannot prevent. We shall see commercial and industrial competition increasing in the Far East, and there is no reason to doubt that it will lead to armed conflict some day, as it did among ourselves in Europe a few years ago.

I would like, at this stage, to point to a group of figures which show the industrial development of Japan within the lifetime of a middle-aged man of to-day. In 1868, or 56 years ago, at the time of the restoration to power of the grandfather of the present Mikado, she had no factories at all in the modern sense. In 1900 she had some 7,000; to-day she has about 25,000.

The growth of Japanese shipping has kept pace with this rapid industrial growth. Japan has her trade routes not only across the Pacific, but over the whole world; and we, who realise that the safety of our Empire depends on our being able to keep our trade routes open, can sympathise with her, because she is in the same position. If her communications with the outer world are cut, she will be in danger of starvation, not only in the matter of food, but also of raw materials—wool, cotton, iron, etc. It is not enough for her to have a strong strategical position if she remains vulnerable on those lines of communication. It is not enough to know that in her corner of the Pacific, thousands of miles from Europe and the United States, she cannot be beaten in direct attack. She has to bear in mind the fact that she could be worn down without being attacked, if her supplies were cut off.

That is her point of view towards America and Europe. But she also has to take into account the two remarkable Powers to west and north of her. She may have nothing to fear from China or Russia at the present moment, because both are in a chaotic state of government. But if we are to believe the best authorities on China, that vast country is being gradually transformed. I do not think that any amount of transformation will ever make the Chinese an aggressive race, because we have four thousand years of their history to show that it is not in them. They have from the earliest times been a pastoral and agricultural people, good traders and workers, good artisans and labourers; never a fighting race like the Japanese or Prussians. But they may quite conceivably develop more power to resist aggression on the part of others, and that is enough to alarm Japan. Roosevelt, in his *Autobiography*, wrote of "the frightful calamities that have befallen China because she has had no power

of self-defence." Perhaps without ever becoming aggressive she will develop that power of self-defence; and if she does, Japan, like all the rest of us, will have her work cut out for her.

North of China, again, is the formidable power of Russia—outwardly changed, as a man's appearance is changed after fearful sickness, but in essentials the same as before. Do you remember the stories we used to hear about exiles to Siberia in the time of the Tsars? about sinister secret police in Russia? about the squalor and sufferings of the mujik? about the fiendish cruelties of Ivan the Terrible and Peter the Great? about the expansion of Russia towards Turkestan and Mongolia, and her ambition to have outlets on the Black Sea and the Pacific? It is all just the same now; if they manage to retain power, the present rulers of Russia will follow on the same lines as the old ones; or, if they are driven out by some new Ivan or Peter, he will go on as before. If we do not realise that, Japan does. When she looks ahead, she has to take into account the likelihood, if not the certainty, that some day China, or Russia, or both, will become a grave menace to her. Now that she has annexed Korea and so planted her foot on the mainland, she is even more precariously involved than if she were only an island Power. It is as if we came into possession of Denmark, or of the Cherbourg promontory in the north of France. Think what a difference it would make to our position in Europe!

I cannot dwell longer on the Japanese point of view, so I merely repeat the three points on which I have laid stress:—

- (1) the problem of her surplus population,
- (2) the problem of external supplies,
- (3) the possible danger from China and Russia as near neighbours.

I now cross over to the other side of the Pacific, and look at the situation from the American point of view.

II.

Our American cousins have their frailties and virtues like everyone else, but false modesty is not one of them. They do not underrate their own importance in the world. They are convinced that the U.S.A. are the greatest of the Great Powers, the hub of the universe, and that they must be "top dog" in the Pacific. The Japanese have precisely the same idea about their own country, so the two must necessarily come into conflict; not armed conflict, perhaps, but economic conflict, and a conflict of ambitions.

The United States gave hostages to fortune when they stretched across the Pacific to Hawaii and the Philippines. It is not for a humble student of world politics to judge whether, on balance, they are a source of advantage or a weakness to her. One of the greatest of modern Americans, Theodore Roosevelt, held that the Philippines were indispensable to America as an advanced base. Other strategists deny this, and go so far as to say that the Philippines would be a gift to Japan within the first few weeks of a conflict, because before an American fleet could

steam 5,000 odd miles to defend this base, the Japanese would be in possession of it; and furthermore, that the American fleet would then be helpless for lack of coal, and would consequently be at the mercy of the enemy. However that may be, America has thrown herself right across the Pacific, and in the Philippines she is at the very door of China. We cannot blame the Japanese if they feel misgivings about this. Mr. Roosevelt himself told them that their sphere was in Asia, while the American sphere was on the continent of America: in other words, that each Power could keep on its own side of the Pacific, and they need never collide. If in spite of that they see the United States spreading across to the Philippines, with stepping stones at Hawaii, Midway Island, and Guam, they are quite right to take necessary precautions.

The attitude which Americans have taken up over the immigration question has naturally accentuated the rivalry between them and the Japanese. The Americans of the Pacific States, who are the people who matter in this case, dislike and look down on the Japanese. They make no distinction between them and the Chinese, Siamese, or other races of Eastern Asia, but bracket them all together as "yellow men"; in fact, many of these people, who for twenty years have been agitating for the exclusion of the Japanese, and who are at the back of the recent anti-immigrant troubles, look upon them as simply another form of "nigger." The intense racial feeling along the Pacific coast is not comprehensible to us in England for the same reason why we cannot understand the intense feeling of the French against the Germans. We have never been in the same peril as France from a stronger neighbour on our frontier, and we have not enough imagination to put ourselves in her place. In the same way, England enjoys immunity from racial dangers, and people who are thus immune cannot imagine how those dangers affect other people. The objection of the Americans to Japanese is partly racial and partly economic. It is racial in that they object to the idea of having Japanese proprietors of American soil, employing American men and women in a subordinate capacity. It is economic in the sense that the American artisan or labourer cannot compete with Japanese labour, which is equally efficient and very much cheaper. So American trade unions are up in arms. Our own people in Canada, Australia, and New Zealand are not less emphatic than the Americans, and do not differentiate much between Japanese and other yellow or brown races.

The Americans are quite within their rights in objecting to a Japanese invasion. Mr. Roosevelt put the case fairly and squarely, as usual, when he said: "The Japanese themselves would not tolerate the intrusion into their country of a mass of Americans who would displace Japanese in the business of the land. I think they are entirely right in this position. I would be the first to admit that Japan has the absolute right to declare on what terms foreigners shall be admitted to work in her country, or to own land in her country, or to become citizens in her country. America has and must insist upon the same right. The people of California were right in insisting that the Japanese should not

come thither in mass, that there should be no influx of labourers, of agricultural workers, or small tradesmen—in short, no mass settlement or immigration."

The Japanese complaint is that the recent American legislation is uncalled-for. They maintain that the so-called "Gentlemen's Agreement" of 1908, under which Japan herself, out of deference to America, restricted the flow of Japanese immigrants into the U.S.A., was working well and doing all that was necessary and that the new legislation discriminates between immigrants from Japan, who are shut out, and those from France, Italy, and other European countries, who are still allowed to come in. In other words, they complain that the issue is now purely racial, and insulting to them.

It is naturally an intolerable position for them. They resent being classed with Chinese and other Asiatic races, because they consider that the events of the last thirty years have given them a superior status. They also resent the suggestion of inferiority to white races which is implied in their exclusion from white men's countries, because they consider, quite rightly, that those events have put them on a footing of equality with the white races. They defeated the Russians twenty years ago, and sat in judgment on the Germans and Austrians after the Great War. They were among the Big Five at Versailles; and, after having accepted their aid in 1914, we can scarcely turn round now and deny them equal rights with ourselves.

How far Japan will be able to redress this inequality and assert a right to enter other people's countries,—this remains to be seen. It is a problem of the Pacific which we or our descendants will some day come up against in an acute form. For the present America has made up her mind, and is not going to draw back. She is evidently determined to make the Pacific seaboard safe for her own democracy. She sets us a good example in this respect.

Will Japan fight America? The question is constantly raised, but is one of those speculative problems with which I have no time to deal here. It seems to me that Japan is in more danger from China or Russia than from the U.S.A., or ourselves on the other side of the great Ocean. Whether in a passive or an active rôle, she is more closely committed in north-eastern Asia than anywhere else, and is more likely to come into conflict with her rivals there. Now that she is being shut out from the North American continent and from Australasia, she has an additional reason to look westwards for means of expansion. Secondly, the annexation of Korea has made her a Continental Power. Thirdly, Russia contains aggressive elements which may at any time renew the menace to Japan in the Far East. For more than one reason, therefore, Japan has to watch her neighbours to west and north-west of her carefully.

III

I have sketched briefly the points of view of Japan and the United States. Behind these two protagonists is the vast form of China.

China is the pivot round which all Pacific problems revolve. In size she is one of the greatest Powers on that Ocean; in population she is by far the greatest. You will find that every one of the Western Powers, in its outlook upon the Pacific, keeps one eye all the time on China. We have all tried, with varying success, to grab portions of her territory. We have tried to dominate her trade, and obtain the first place in her huge markets. We have heard allusions to the "yellow peril," "slumbering millions" and "awakening giants." But what is not always realised fully is the latent strength of the Chinese. Most of us look upon them as an inferior race, only semi-civilised and very backward. Backward they certainly are, if we take them collectively. The peasants and labourers in remote parts of the country live in a state of ignorance, squalor, and misery, though I doubt if it is worse than in Russia and other parts of Europe. On the other hand, the better class of Chinese are an exceedingly fine race. To look upon them as inferior to ourselves, or less civilised, would show ignorance on our own part. They have traditions that go back not only beyond our Norman and Anglo-Saxon periods, but far beyond the early ages of Greek and Roman civilisation. They are people of great natural ability, supreme in every branch of commerce. And in addition to their natural ability, they have a courtesy of manner that makes them pleasant to deal with, either in business or in social intercourse.

They are extraordinary people; and it strikes me more forcibly the longer I think about it, that China is not conquerable. You cannot *conquer* such an immense mass of people, and their civilisation is so strongly rooted that you cannot even shake it seriously. At present, however, this vast and clumsy organism has no head, no organisation, no fixed purpose, no means of carrying out a purpose. Yet it is very much alive, and its potential strength is beyond the reach of our imagination. To talk of Japan *conquering* it, or annexing it, or even guiding it, is unthinkable to me, because China is greater than Japan in every way but one: namely, that she hates and despises fighting and every form of strenuous competition. That seems to me to be the only respect in which she is not the equal or superior of any other people, white, brown, or yellow.

I shall not attempt to give even an outline of Chinese political history during the last few months. Chinese civil warfare has a style of its own, not like anything else with which we are familiar. And even if I could explain the ups and downs of Chang Tso Lin, Wu Pei Fu, Feng Yu Hsiang, Tuan Chi Jui, and other Celestial leaders, it would serve no useful purpose, because the relation of these men to the inner life of China is the relation of foam on the crest of a wave to the deep waters that lie beneath. I would, however, emphasise the fact that China is changing, slowly, perhaps, but surely, under the influence of Western civilisation. Nothing will make the Chinese become European. They have too much individuality; and a civilisation that has endured for 4, 5, or 6,000 years is not going to alter fundamentally in the course of a man's lifetime. But

they will alter externally, even as we have altered in the last fifty years, though we are still the same people of Shakespeare and Nelson. Scientific knowledge, hygiene, and mechanical invention will filter through these myriads of people, and make a vast difference in them. Observers on the spot tell us there has already been an extraordinary change in the last few years. You have no doubt heard about the Young China Movement, which is largely directed by young students and people of radical, not to say revolutionary, tendencies. Like youthful enthusiasts all the world over, these young Chinese want to reform everything, and obtain the millennium by return post. Their zeal often outruns their judgment and their powers; but they are a great force, and their influence upon the future of their country is likely to be momentous.

What China needs to-day is a strong Government to keep order and assist in her development. At present the weakness of the Central Government is a hindrance to herself, and is a source of anxiety and danger to everyone else. The lives and property of our fellow-countrymen can never be thoroughly safe with an unstable Government that cannot put a stop to bandit outrages and the vagaries of military chieftains. On the other hand, a well-ordered and prosperous China will tend towards stability. It is not in the Chinese to be an aggressive nation, and the idea of swarms of them rushing forth to invade the American Continent, Australia, and New Zealand is fanciful. They will be more likely to assert their right to regulate their trade with us, and to shut out foreigners when they feel inclined. That may become inconvenient for us from the commercial point of view, but we cannot deny them that elementary right if we go on calling them a Sovereign Power. Such an eventuality is, however, not likely to happen in our time.

Before passing on to the concluding portion of my Lecture—the consideration of our own position in the Pacific—let me sum up a few impressions. The general impression we get from our subject is that

forces are rising up in the Pacific which may some day get out of control. (1) One is the expansion of Japan, whose population is increasing rapidly, but is refused admission into other countries where it might find an outlet. (2) A second force is rising up in China. Her population question is also likely to become acute, especially if she adopts Western methods of hygiene, and avoids the frightful wastage which has hitherto been due to disease and pestilence. (3) A third is the expansion of the United States, which are still as it were a young giant, growing rapidly. (4) In the north-west corner of the Pacific is a fourth—Russia, a huge Power, of which no wise man would attempt to predict the future five years ahead. (5) In the north-east and the south-west of the great Ocean you find our own Empire, represented by Canada, New Zealand, Australia, various Dependencies, and two links in the chain which binds London to the Far East, Singapore and Hong Kong. Here are five forces that are growing up in the Pacific; and we have made no mention of the interests of France in Cochin China, or of the South American States.

Another impression we get from this study is that the broad line of

cleavage in the Pacific is racial, and not national. Japan belongs to Asia; the inhabitants of America belong to Europe. If Japan were to fight Canada or Australia for the right of immigration, the U.S.A. would join in with our Dominions, and *vice versa*. The same idea is at the back of the Japanese mind when they think of an Asiatic Monroe Doctrine—Asia for the Asiatics. It is a perfectly just idea. Japan ought to support China in her claim to independence, and if she were large-minded enough to do so, they would be a formidable combination. But at present it seems unlikely, because there is hatred between the two. Like other nations, Japan, instead of helping China, has aimed at suppressing her, and squeezing everything out of her that could be squeezed. The Chinese have been alive to this, and will try some day to get their own back from the Japanese. Yet this does not alter the fact that Japan really belongs to Asia, and must find her ultimate development along Asiatic, and not European, lines.

IV.

Meanwhile, how do we stand ourselves in the Pacific? The British Empire is potentially the greatest Power in the world at present, and she has interests in the Pacific second to no other. Three of the Dominions are there; two of the foremost trading centres in the world, Hong Kong and Singapore; and groups of Dependencies like Fiji, British North Borneo, New Guinea, and the Mandatory Islands south of the Equator. We are thus involved on the Western seaboard, on the Eastern, and on the Southern. Only to the north-west, where Japan, China, and Russia stand facing one another, is there no portion of the British Empire.

Our position in the south-western Pacific has received much attention of late in connection with the question of Singapore. I try to look at that question not from the point of view of a soldier, who may be expected to show professional bias, but from that of a plain citizen, who only has an ordinary measure of common sense to go by. Looking at it in that way, I notice that a continuous chain of bases and coaling stations runs from the United Kingdom through Gibraltar, Malta, the Suez Canal, and Aden, or alternatively through Sierra Leone, Cape Town, and Mauritius, to Ceylon and Singapore, and from there to Hong Kong in one direction, Australia and New Zealand in the other. If we are prepared to adopt the policy of Denmark, and leave ourselves entirely unprotected, well and good. But if we are going to make any preparations at all in case trouble should arise, it appears to me to follow that Singapore should be strongly fortified, so that our chain cannot be broken there. The more I study other nations, the less I like those things with the new-fangled name of "moral gestures." A moral gesture is the last thing to earn the respect of a Japanese, or a Chinese Tuchun, or a high-minded American, or a patriotic Frenchman; they will like us better if we say to them fairly and squarely: "We propose to fortify Singapore because it is a vital point on our line of communications between London and our people in the Pacific. It is obviously no menace to you Japanese and Americans because it is too

far from either of you, and is outside the zone that we agreed upon at the Washington Conference, within which no new fortifications were to be constructed. Our ships in Far Eastern waters need a base where they can be secure and can carry out necessary repairs. Singapore is better than Hong Kong for another reason: that it gives us more security against aircraft; and the volume of trade that passes through the Malacca Straits is so vast that we must have the means of protecting it adequately."

I can understand, without necessarily accepting it, the argument that advocates Sydney Harbour in preference to Singapore. I can also understand, without necessarily accepting it, the argument of those critics who contend that a fortified base at Singapore is a waste of money in these days of submarines and aircraft. But I cannot work up any sympathy with "moral gestures," and am out of touch with people who appear afraid of what Japan or America may say about Singapore. The Prime Minister said recently in fine words: "Our duty is to lead the world, and not to follow anybody." If we apply that test to Singapore, we shall do what our responsibility imposes upon us, and not wait for the approval of other Powers. The best men in every country know quite well what our motives are, and those are the only men who really matter.

It is instructive to contrast the positions of Canada and the Australasian Dominions in the Pacific. Canada is the go-between between the United States and ourselves. She has so much in common with the United States that she will frequently appreciate their point of view when it is obscure to us; at the same time she has a national consciousness strong enough to remind the United States that they are only one half of the North American Continent. We cannot be too often reminded of the standing wonder of that undefended frontier of 3,000 miles between Canada and the United States. I know nothing like it in Europe.

Australia and New Zealand, not being in contact with another Power, have a different character from that of Canada. In spite of their distance from us, away at the Antipodes, they are in closer sympathy with the Mother Country, and in their relation to the problem of the Pacific they look solely to themselves and the Home country, having no powerful neighbour to think about. The Singapore question, which is vital to Australia and New Zealand, does not affect Canada in the same way. Australia and New Zealand depend more on us than Canada does; and if all three feel anxiety about competition from Asiatics, Australia and New Zealand look to us for protection, whereas Canada derives a great deal of security from the fact that any menace to her is a menace also to the United States, which they will help her to repel. For that reason Singapore is of vital consequence to the Australasian Dominions; it is the first link in the chain that binds them to London.

I would not feel justified in attempting to discuss the situation in the Pacific from the point of view of naval strategy. I am to some extent afraid of the frown of authority, but still more afraid of the ridicule of critics who know more about naval strategy than I do. I notice that each of the three strongest Powers in the Pacific says one of the others is doing

something she should not do under the Washington Agreement; sometimes it relates to gun elevation, sometimes to naval manoeuvres, or to fortresses, or vessels other than capital ships. It is too much to expect any one to trust anyone else in those distant waters. Japan learnt a bitter lesson in 1895, when Russia, Germany, and France squeezed her out of the Liao Tung Peninsula on an unctuous pretext, only for Russia to step into her place three years later and seize the very territory she had said it would be wrong for Japan to occupy. The dubious action of Japan in presenting her Twenty-one Demands to China in 1915 may have been the natural outcome of the treachery she had experienced twenty years earlier. The British Empire will remain predominant in the Pacific, as it ought to be, if it is entirely open-handed in its dealings with friends and rivals alike.

This study of the problems of the Pacific has led me to two conclusions, among others:—

(1) That many of the dealings of the Western Powers with China cannot be defended on any principle except that Might is Right. Might need not necessarily mean any form of oppression or cruelty. It can go with courtesy, chivalry, mercy, justice, and kindness. It can be used to make men happier, healthier, and in every way better. But from the time when Europeans first appeared in the Pacific until to-day, the Chinese and Japanese have never wanted them; and if we have any right to be there, it is might only that gives us that right. It would be foolish to suggest that we should evacuate China merely because China does not want us, but perhaps some day China will put her house in order, and be in a position to compel us to treat her in the same way that we treat Japan, France, or any other Power with which we have dealings.

(2) My second conclusion arises out of that possibility: it is, that the line upon which we of the British Empire should go in the future should be not only to allow China, but even to assist her, to develop her power. We must never admit the idea Japan expressed in 1914 when she said she could not tolerate the awakening of some 400 million Chinese which would follow if China went into the war on the side of the Allies. A man who begins by being afraid of his rival is already half beaten. The British Empire has no occasion to be afraid of any other Power, least of all of China, because as I have pointed out more than once, the Chinese have never, since the dawn of their history, been an aggressive race. To those who are still afraid of a "yellow peril," I would commend the reading of a small book called "The Awakening of Japan," by Okakura Kakuzo, published in 1905. He says there:

"Not once during the whole of their history do we find the native dynasties of China and India coming into collision with one another. The only occasion on which China ever menaced Japan was in the 12th century, when her own Mongol conquerors tried to impose their authority upon us." (203).

Recent events in China may give the impression that a military spirit is becoming prevalent there, and that the present system of Tutchuns, all at loggerheads with one another, reducing the government of the country

to a state of chaos, may be followed some day by the rise of a super-Tuchun, another Yuan Shi Kai, who would first consolidate his own power, and then direct it against us Europeans. It is conceivable if we imagine such a man merely asserting the sovereignty, independence, territorial and administrative integrity of China. It is not conceivable if we imagine any active designs against us; any threat to our Dominions and Possessions in the Pacific. It is conceivable that young people of to-day may live to see China an independent State in the same sense that Japan is, having done away with extra-territoriality, and compelled us to deal with her as an equal, not an inferior Power. But from that to becoming an active menace to other nations is a far cry. It is not necessary for us to trouble ourselves about that possibility for the present.

I can, however, see no limits to the expansion of the Chinese if, after assimilating our knowledge of science and hygiene, they increase and multiply even more rapidly than at present. It is appalling to think that if they multiply even at the same rate as we do—and our rate of increase is not very rapid—they must have added sixty million to their population since I was in China as a subaltern! Sixty million! and the whole population of the United Kingdom is only about 43 million! A force like this is, as I said before, something elemental which it passes the wit of man to cope with. Nature alone can cope with it. She has hitherto kept down that immense population by various means—partly by an extra strenuous application of the law of survival of the fittest, in various forms of plague, pestilence, and famine; partly by visitations like the Taiping Rebellion, which is said to have cost some 15 million lives; partly by physical agencies like the Yangtze shifting its course from one bed to another and drowning people like swarms of insects. In what way she will deal with the problems of a new China which has adopted Western scientific methods and engineering we cannot attempt to foretell.

In the present consideration of every problem that arises, we have one question to ask ourselves: What is the best line to take for the welfare of the Empire?—remembering always that it is our duty to lead the world, and not to follow anybody. If there were any way of obtaining the opinion of the Chinese and Japanese as a whole, it would be seen that we stand higher in their regard than any other Power. I am inclined to agree with the author of that excellent new work—"Western Civilisation and the Far East," Lieut.-Commander Stephen King Hall, R.N.—that the reason for this is that in our dealings with them we have never made professions of idealism, which they do not understand, but have gone on straightforward business lines, which they can grasp. We have, too, the initial advantage of standing high in the regard of all Asiatic races. They naturally do not like us, partly because they do not go in for altruism and universal love, but still more because it would be too much to expect anyone to like strangers who come in at the gate unbidden and refuse to go away again. Without liking us, however, they respect us, and if we remain the strong and straightforward people we have been, they will continue to respect us.

If we keep before us the idea of a strong and united Empire, we shall avoid mistakes that others have made. I have already alluded to a Japanese idea on the outbreak of the Great War, that if China were allowed to come in on the side of the Allies, it would lead to an awakening of her 400 million people, and would be a menace to Japan. That is an unworthy notion. Japan can never lead the Asiatic races, as she aspires to do, if she is afraid of them and keeps them in bondage; and they will not be worth leading. The Japanese make a mistake in suppressing, or trying to suppress, the Chinese. If they had been more large-minded, they could by this time have bound the Chinese to them by bonds of gratitude, and made themselves all-powerful in the Western Pacific.

If we keep to our Imperial ideals, we shall also avoid the mistake certain Americans are making in exasperating the Japanese by their immigration laws. I have never seen any reason given for supposing that the "Gentlemen's Agreement" of 1908, by which Japan herself undertook to restrict her immigration into the United States, was not sufficient. So far as an outsider can see, it would appear that extremist opinion has prevailed over more moderate counsels, and that something has been done that was uncalled-for. The Japanese will not forget it; no self-respecting nation would. I am afraid there has been a lack of generosity on the side of the Americans of late, and I devoutly hope my own countrymen will take note of it, and banish every thought of jealousy and fear from their minds.

It appears to me to be inevitable that a conflict should occur some day in the Pacific, but it may not take the obvious form of a fight between two nations like Japan and the United States. The leaders of Japan are too shrewd to take on such a colossal fight with their present resources, and the United States are not likely to initiate such a war. It is more likely to be a struggle between East and West; between two civilisations, Oriental and Occidental; between their idea of Contentment and our idea of Progress. A struggle of that kind is not to be settled by a war. We have the example of the last war to prove that: it has settled nothing. The conflict between France and Germany is as bitter as ever; so is the so-called conflict between Capital and Labour; while a new form of plague has arisen, Bolshevism, the final effect of which no man can foretell.

When this huge conflict in the Pacific does come, it will take a course as unexpected as that of the Great War, and produce still more frightful results. But we cannot prevent it by saying "Oh! how dreadful!" We shall do better to admit that it will come, and shape our policy accordingly. In my humble opinion, the best preparation we can make is, by every word, thought, and act, to help to consolidate the British Empire; above all, to have things in good order here, in the United Kingdom, because the Empire will always depend on the Mother Country, and our destinies in the Pacific will be unrolled here, in London. This in our own interests, but also in the interests of others. The development of China; the future progress of Japan; the revival of Russia in the Far East; the racial and economic problems of the United States on their Pacific sea-

board; the security of Australia and New Zealand—all these will be affected, for better or for worse, by the condition of the British Empire as a whole. The destinies of the Pacific, which are the destinies of half the globe, depend more than we realise on this little island of ours, whose sons

"are neither children nor gods, but men in a world of men."

DISCUSSION.

ADMIRAL V. H. G. BERNARD, C.B.: I would like to thank the lecturer very much for the exceedingly interesting lecture which he has placed before us very clearly indeed. With regard to the question of Japan being in a position to attack Manila, I have been told by people who have recently been out in the East that Manila and the Philippine Islands are more or less honeycombed by the Japanese, and that at any moment, without sending a man to the Philippines, the Japanese, who are always organised and in communication with headquarters in Japan, might possibly be able to rise up and seize the islands. I have also been told by an Englishman from Borneo that Japanese naval officers have been reported to have been seen working as coolies in Borneo. I imagine that naval officers would not work as coolies simply for the purpose of earning their living. I have been told also that Singapore is full of Japanese, that every Jap is known to correspond with headquarters in Japan, and that there is a card index in Japan containing full particulars of the Japanese in Singapore. I have been told that Japan is gradually extending her influence and that every Jap who emigrates is kept in touch with headquarters in Japan. This is, of course, all hearsay. I think the distance of the Philippines from America is a point of great importance.

MR. A. R. HAVILAND: With regard to the question raised by the lecturer as to the United States warships having to return to their bases for coal, I should like to mention that at the present day warships can carry oil fuel which would last for a considerable time—that oil fuel could be transported even by submarines.

LIEUTENANT T. H. KEBLE: I would like to make a few remarks with regard to the point mentioned by the lecturer that Japan is overpopulated. It seems to me that, territorially, Japan is not overpopulated, but from the point of view of food supply she is overpopulated. It might make it clearer, therefore, in speaking of Japan being overpopulated, to say that she does not grow sufficient rice, which is her staple food, for the number of people who occupy the territories of the Japanese Empire. I should like, in the next place, to refer to a point mentioned by the lecturer in regard to China. He laid stress on the point that there is one essential difference between China and Japan, namely, the lack of the desire on the part of China to fight. The point that occurs to me is that, as mentioned in the book by Lieut.-Commander King-Hall, China lacks a spirit of national consciousness, and I think that is really what must be behind any lack of desire to fight. There is no national consciousness throughout China, and I consider that to be the essential difference between China and Japan, because Japan showed in the Russo-Japanese War that she is full of the spirit of national consciousness.

GENERAL SIR EDMUND BARROW, G.C.B.: There is one question I would like to ask the lecturer, and that is whether he purposely avoided saying anything on the subject of the Dutch possessions in the Indies, *i.e.*, Borneo, Sumatra, etc.,

because it seems to me that the Japanese are also very much interested in this aspect of the situation in the Pacific. The Dutch possessions are a possible field for Japanese colonisation. It is an Asiatic area and vast tracts of the Dutch islands are practically uninhabited. I am not speaking of Java, or Sumatra, because the former is densely populated and the latter is too near the British sphere, but I am referring to other parts of the Dutch possessions like the Celebes, Dutch Borneo, Western Guinea, and many of the other islands. There, it seems to me, the Japanese might find a field for colonisation, and if the lecturer could tell us why he did not feel it desirable to include those territories in his lecture it might be of some interest.

SUB-LIEUTENANT W. R. GORDON, R.N.: I was particularly interested in what the lecturer said about Japan not desiring to send any of her emigrants down to South America. Naturally she would not want to do so, because thereby she would lose the virtue of her great strategic position in the north-west corner of the Pacific Ocean. If Japan sent emigrants down there, however suitable these countries might be both from the climatic point of view and the areas which could be occupied, her surplus population which she got rid of in that way would be of no use to her in the future, because they would be completely cut off by the United States, and, incidentally, by ourselves from Australasia. If Japan took the Philippines from the United States, as the lecturer suggested, surely she would be able to cut out United States competition in Chinese markets, and that is, I think, Japan's object to-day. What Japan wants is to use her brains to control the man power and resources of China. With regard to America, the Exclusion Bill seems to have been rather untactfully worded. I think the Australian method, by which they devised a dictation test, was more tactful. The Australians intimated to the Japanese by these means that their presence was not wanted in the country merely from the economic point of view. They did not stress the fact that they disliked them racially, but they stated that the Japanese worked at very much lower rates than their own white workers and consequently lowered the standard of living. With regard to the question of the awakening of a national consciousness in China: in the Chinese-Japanese War of 1895 China saw the vast strides that Japan had made in such a short space of time, and how she had been influenced by Western ideas. Consequently she set to work to reform. But the reforms were not complete and consequently the Empire fell, mainly due to Southern Chinese efforts. Southern China has never been controlled thoroughly by the Manchus in the North, and Southern China is, therefore, far more revolutionary and socialistic than Northern China, which has been dominated by them. I think the Russo-Japanese War was a matter of very great importance; then the idea of white invincibility was shattered, because a Power like Japan had managed, by copying Western methods, to defeat a Western nation. Incidentally, there is a fact which might well be borne in mind, as one of particular interest to ourselves, namely, that the British Empire controls all the exits from, but none of the actual waters of, the Pacific. We hold Jamaica, which confronts Panama; we have Singapore and the possibility of building a large base there; we also possess most of Australasia, while the Falkland Islands control the route round Cape Horn. But in the central Pacific Ocean Great Britain has practically no islands or ports which could control those waters. She allowed America to take the Hawaiian islands.

MAJOR FERGUSON, in reply, said: In the first place, I wish to thank everybody for taking such an interest in the lecture. I took a good deal of trouble to work it up, and it is a pleasure to find it is appreciated.

With regard to what Admiral Bernard said about Japanese officers working as coolies in the Philippines and other places, I am afraid I may be unorthodox in these matters, but I cannot take that seriously. The Germans used to do a good deal of that sort of thing before the war, but it did not help them much. If Japanese officers are working as coolies, I should simply say: "Let them. I do not think they could do much harm by prowling about and spying." If people are caught at that game, lock them up for as many years as possible, because it is evil work. But otherwise I would not take it seriously.

With regard to the next question raised, viz.: the great distance of the Philippines from America: that, of course, is a most difficult problem, which I alluded to in my lecture—the problem of the long line of communications along which the U.S.A. have to defend the Philippines. I cannot do better than refer you to an excellent book on that subject by Mr. Hector Bywater, called "Sea Power in the Pacific." He goes fully into that question, and many of my observations were taken from his book.

Mr. Haviland raised the question of oil fuel. If he reads German, he will find an article in the *Marine Rundschau* on the first ten years' working of the Panama Canal, in which the author points out the large percentage of oil vessels that pass through the Canal. The Americans are using oil-burning vessels more there than coal-burning, having large supplies of oil along the Pacific seaboard. The Report of the Governor of the Panama Canal ought to be out soon, and that will doubtless give still further details.

Mr. Keble referred to the overpopulation of Japan as being true only from the point of view of food supplies. That seems to me to be sufficient in itself. It is a grave problem for them, as it is for us. They would not have to worry about anything if they could be sure of their food supply at all times, but they cannot, and their population increases by about 2,000,000 every three years. Mr. Keble also thinks China lacks national consciousness. There, again, the Chinese have changed very much, even in the last few years. They showed it at the time of the Versailles Conference. You will remember the representatives of China left the Conference. There had been a storm of indignation in China, largely organised by the Young China Movement, over the way the demands of China were being ignored. Demonstrations were held all over the country on such a scale that the ruling powers at Peking sent telegraphic orders to their representatives to leave the Conference and not put their signatures to the Treaty. That was a symptom of growing national consciousness. I would refer Mr. Keble to Putnam Weale's "Indiscreet Chronicle from the Pacific." He will find there a memorandum drawn up by Mr. Putnam Weale for the Prime Minister at the time, Mr. Lloyd George, which shows the remarkable change that is coming over Chinese national feeling. I would also commend to you an article in the current number of the *North American Review*.

Finally, General Sir Edmund Barrow remarked that I did not refer to the Dutch Possessions in the Pacific. I simply had not time to. The subject is too big. With regard to the question of the Japanese being cut off from their own country when they emigrate to South America, I fully appreciate the point raised by Sub-Lieutenant Gordon. That may be the reason why they do not go there more readily; I have never seen any more satisfactory reason given. You must remember the Japanese are not a tropical nation; they do not stand tropical climates well. They like best to go to North America, partly on account of the climate, but perhaps also in part because they feel less cut off than in the South American States.

I thank you again very much for the kind way in which you have received my lecture.

THE CHAIRMAN (Admiral Sir Reginald Tupper): Ladies and Gentlemen, It is my pleasant duty to propose a vote of thanks to Major Ferguson for his excellent lecture, and also for the way in which he has dealt with the points raised by those gentlemen who have been kind enough to take part in the discussion. The hour is late so that I think it will be better for me not to burden you with my own views on this subject. With regard to Mr. Haviland's remarks on the subject of oil, of course it must be remembered that vessels that use oil fuel can get their fuel renewed at sea more easily than vessels that use coal can fill bunkers with coal at sea, in fact it is quite easy to oil at sea. It is quite true that if the United States wanted to re-fuel any war vessels away from the American coast or away from their base, they could do it by means of oilers on the high seas. It seems to me that the Japanese know their limitations, and they are our very good friends. We have been allies for many years and we are both maritime nations; and, so far as I am able to form an opinion, I do not think there is likely to be a great deal of friction between the Japanese and ourselves over the future of the Pacific and I hope they will always remain our allies (Cheers). As regards U.S.A., I am a great believer in the mutual support of the English-speaking peoples keeping the Peace of the World.

Ladies and gentlemen, I hope you will join with me in passing a very hearty vote of thanks to the lecturer for his most admirable paper and for the interesting remarks he subsequently made. I can only hope he will come here again and tell us what he has omitted to tell us to-day with regard to the Dutch islands, about which Sir Edmund Barrow raised a question (Cheers).

The resolution of thanks was carried by acclamation.

ADMIRAL SIR HENRY DRURY WAKE, K.C.B.: Ladies and Gentlemen, I have a pleasant duty to perform, and that is to propose the thanks of the company present to Sir Reginald Tupper for the way he has presided over the meeting to-day (Cheers).

The resolution of thanks was carried by acclamation, and the meeting terminated.

Note.—A letter on the subject of this lecture appears under Correspondence p. 343.

PUBLIC SCHOOL ENTRY INTO THE ROYAL NAVY.

By LIEUTENANT-COMMANDER W. S. GALPIN, F.R.G.S., R.N.

IT is, perhaps, not generally realised, more especially outside the Naval Service, that of late there have been no less than four different methods, at four separate ages, by which a boy wishing to join the executive branch of the Royal Navy might do so. These, in the order in which they were originally instituted, are, firstly, entry into the R.N. College, Dartmouth, from a preparatory school or elsewhere between the ages of 13 years 4 months and 13 years 8 months; secondly, entry into the R.N. College, Dartmouth, from the Mercantile Marine Training Establishments "Conway," "Worcester" and "Nautical College, Pangbourne," between the ages of 14 years 8 months and 15 years; thirdly, entry direct from a Public School or elsewhere, by what is known as the Public School or Special Entry method, between the ages of 17 years 6 months and 18 years 6 months; and lastly, by entry from the "Conway," "Worcester" and "Nautical College, Pangbourne," between the ages of 16 years 8 months and 17 years.

Of these four methods, the first, namely, entry to the R.N. College, Dartmouth, at the age of about 13½, is the best known, and after this the largest number of entries is produced by the Public School or Special Entry method.

As regards the other two methods, namely, by entries from the Mercantile Marine Training Establishments, it was felt that boys from these, who receive a very excellent training, should be given the opportunity of joining the Royal Navy, should they wish to do so, and it was therefore arranged that a certain number of nominations to Naval Cadetships should be granted annually to each of them, these nominations being available for boys able to pass a qualifying examination and satisfying certain specified conditions. The system of entry of boys between the ages of 14 years 8 months and 15 years to the R.N. College Dartmouth, is only available to boys who joined the three Mercantile Marine Training Establishments prior to the 1st January, 1925, and is being replaced by the nominations at the later age, so that boys who join these establishments after that date must make use of this latter method if they wish to enter the Royal Navy. Those who avail themselves of these nominations, between the ages of 16 years 8 months and 17 years, if they satisfy the conditions specified, are appointed to a Reserve Fleet ship for a course of one year, and come under the same regulations as are laid down for the Special Entry Cadets.

The two principal methods of joining the Navy, however, are

undoubtedly the Dartmouth and the Special Entry methods, and there has been, and still is, a great deal of discussion as to which of the two is the better. The Dartmouth Entry was first instituted in 1903, when entries into the "Britannia," the famous ship in which so many generations of naval officers received their first training, were stopped, and under what was called the "New Scheme," Cadets were then entered at the R.N. College, Osborne. There the Cadets spent two years, after which they went on to the R.N. College, Dartmouth, for a further period of two years, followed by six months afloat in a training cruiser before being appointed to sea-going ships of the Fleet as Midshipmen. On the grounds of economy, both Osborne and the training cruiser have since been given up, and Cadets who join by the Dartmouth Entry now spend three years and eight months at Dartmouth, after which they spend eight months as Naval Cadets in sea-going ships of the Fleet before becoming Midshipmen.

One of the great disadvantages of the Dartmouth Entry is that owing to the early age at which the Cadets are entered, their general, as apart from their naval, education is by no means finished, and this entails not only the necessity of a large staff of civilian masters with high qualifications, thus throwing additional expense on the country, but also makes the training take very much longer to complete. The training, in fact, occupies a considerably longer period than is required, in normal times, to build ships, and in consequence thus makes it extremely difficult to approximate the supply of officers to the number of ships for which they will ultimately be required. The number of ships required, at any given period, must of course depend upon political and other considerations, but the length of time necessary for training the officers who are to man those ships does not so vary. Shortly before the war, owing to the German menace, it was found that we were building ships faster than we were producing fully trained officers, and it was therefore obvious that some more speedy method of producing officers must be devised, in order that the number of entries might be made more nearly to approximate to the number of ships likely to be maintained in commission when the training of those officers would be completed.

It was found that in the Public Schools throughout the country there was material ready to hand, and in 1913, a year before the war, the Public School or Special Entry method of joining the Navy was first instituted. By this scheme, in which candidates were to be entered between the ages of 17 years 6 months and 18 years 6 months, their general education had been practically completed, and as it was therefore only necessary to concentrate on their naval education, in order to turn them into very valuable officers, their training could not only be completed in a very much shorter time, but it could be carried out entirely by naval officers at no additional expense to the nation.

This method was originally instituted as supplementary to the Dartmouth Entry, and was more or less in the nature of an experiment, an experiment which has since turned out to be extraordinarily

successful. It was decided that the Cadets should be accommodated in a cruiser and should undergo a period of eighteen months' training, as Naval Cadets, before being sent to sea-going ships as Midshipmen. Of this period of eighteen months the first twelve were to be spent in harbour, in order that the facilities of the Gunnery, Torpedo and other schools in a naval port might be utilised, together with the advantages of grounds for games and exercise; the remaining period of six months was to be spent at sea, in order that the Cadets might get accustomed to life afloat, and see how what they had been taught was actually carried out in practice.

The cruiser "Highflyer" was detailed for these duties, but before the training of the first batch of these Cadets had been completed, the war started, and the "Highflyer" was required for other duties. It was then decided to transfer the training of Special Entry Cadets to the R.N. College at Keyham, which belongs to the Engineering Branch of the Service. There the Cadets picked up their instruction so quickly that the period of training was shortened. Midshipmen were urgently required afloat, and an impetus to work hard was given by arranging that a proportion of the best Cadets in each term should be sent to sea earlier than the remainder, and a number of Cadets went afloat as Midshipmen after only three months' training.

In spite of the shortness of this period of training, the instruction given was extremely practical, and the Cadets, being naturally keen to get to sea as soon as possible, learned their duties very thoroughly and with great rapidity. The results were extraordinarily successful, and the reports that began to come in to the College from Commanding Officers at sea were highly encouraging to the staff engaged in training the Cadets. As the war continued, larger and larger numbers of Cadets were entered each year, but no falling off in the results was observed, and the reports on the Special Entry Midshipmen at sea continued to be extremely satisfactory.

At the end of the war, when fewer ships and therefore less officers were required, the entries for Dartmouth and those from the Public Schools were reduced, and the hurried war time training was extended, as there was no longer such an urgent need for the Cadets to be sent afloat as soon as possible, and, therefore, the strain could be eased.

It was decided, as the result of experience of Special Entry Midshipmen afloat, that the original period of training of eighteen months, which had been laid down before the war, was too long, and on reverting to peace routine, the conclusion was reached that a year as Cadets would be sufficient. The College at Keyham was at this time again required by the Engineering Branch, to whom it belongs, and the training of the Public School Cadets was subsequently transferred to a cruiser, H.M.S. "Carnarvon," and later H.M.S. "Cumberland." Later still the training of these Cadets was transferred to a Reserve Fleet ship, H.M.S. "Courageous," at Portsmouth, but is now carried out on board H.M.S. "Thunderer" at Devonport.

The entries for Dartmouth were cut down to about one hundred a year, but those for Special Entry, were at the same time limited to only fifteen a year. The response from the Public Schools before the vacancies were so severely limited had been magnificent, and over six hundred Special Entry Cadets had been trained under this scheme, these Cadets being drawn from over one hundred and seventy schools. With only fifteen vacancies a year, however, it meant that the average was only one boy entered for eleven schools competing, therefore, the Public Schools could hardly be expected to maintain their interest in the scheme under such conditions. This severe limit to the number of vacancies for Special Entry, coupled with the natural fear of parents that, on account of the large numbers of Naval Officers being "axed" on the grounds of economy, the Royal Navy offered no settled future for their sons, tended to prevent candidates from coming forward, and instead of the tremendous competition for the vacancies available that there had been before, it became difficult to find suitable candidates even for the small number of Special Entry Cadetships offered, and to a lesser degree the same applied to the Dartmouth entries.

It is naturally vital to the nation, more especially at a time when the Navy has been reduced to the barest minimum compatible with national safety, that candidates of the right type and in sufficient numbers should be forthcoming, and it was obvious that a remedy must be discovered, in order to improve the condition of affairs.

This remedy could be applied in three directions, firstly, by announcing that the "axe" had ceased to fall and thus giving prospective candidates some sense of security, secondly, by sending competent naval officers to give lectures to the boys at the various schools and thus revive the great interest in the Special Entry Scheme which had been taken by their predecessors, and thirdly, by increasing the number of vacancies offered to a more reasonable number and thus again helping to give the schools an opportunity to interest themselves in the Royal Navy as a career.

The Admiralty have attempted to remedy the situation in the first and third of these directions, but have hitherto made no move in the second direction. They have announced officially that the limit to the reductions of officers has been reached, and this should certainly tend to establish confidence among parents and schoolmasters. In fact those who are sufficiently far-seeing will probably realise, when it is pointed out to them, that the mere fact of the "axe" having fallen so heavily, and therefore, swept so many of his seniors from his path, gives to a boy now joining the Service a more rapid chance of promotion than has ever been the case before. The Admiralty have also announced officially, that two examinations for Special Entry will in future take place each year instead of one, and that a *minimum* of thirty vacancies by this method instead of fifteen will be offered for, at any rate, the next four years.

Fortunately the remedy has also been applied in the second direction

by a certain public-spirited officer, who, in his spare time from his naval duties, has been visiting a large number of schools, where, at no cost to the schools, he has delivered an extremely clever and interesting lecture on the Royal Navy as a career, which, on every occasion, has evoked immense enthusiasm and interest on the part of both boys and masters, and has already gone far towards increasing the number and standard of candidates for future examinations.

It is only necessary to bring the subject prominently before the schools in order once more to evoke interest in the Royal Navy as a career among the boys, many of whom, as soon as they learn details of the life of a naval officer afloat and the conditions of entry, are only too ready and willing to present themselves as candidates.

To those who have relations or friends in the Service, it is of course an easy matter to find out the conditions, but to those parents or schoolmasters who are not so placed it is a more difficult matter to discover these and to determine whether or no the boys under their charge would be suited to a naval career. The conditions of entry for each branch of the Service are, it is true, printed in the appendix to the Navy List, but this is not a publication extensively read by the general public, and, moreover, the various conditions, regulations, and details of pay and pensions are presented in a form which it is somewhat difficult for anyone unacquainted with the Royal Navy to understand. With a view to obviating this difficulty on the part of a number of parents and schoolmasters, small pamphlets have been compiled by certain naval officers on each of the various branches. These describe for each branch the conditions and age of entry, the training given and a description of life in that branch, the scope of duties and details of the pay and prospects in each rank, and the pensions that are available on retirement. These pamphlets are being distributed at the various schools, and it is hoped that they will help to render easier the choice of a career to all those who have reached a period at which a decision has to be made.

A further method by which the Navy as a career might be made more attractive to the scholastic authorities of the country would become evident were the Admiralty to give further consideration to the point of view of headmasters. After all it is from the schools that the bulk of candidates must be drawn, and the goodwill of headmasters should undoubtedly be fostered.

It is one of the objects of any headmaster to make a reputation for his school, and this is largely made by his boys gaining scholarships. As far as the Public Schools are concerned, the examination for Special Entry Naval Cadets is the same as that for entrance to Woolwich, and sufficient credit is established by any school from which candidates are successful. As regards preparatory schools, however, the same does not apply. The standard of the examination for Dartmouth has been lowered since it was first instituted, while the age of entry has been raised. The result is that a preparatory school now obtains more credit if boys obtain a scholarship at a Public School than if they pass

into Dartmouth, and the best boys are not encouraged to try for the Navy.

Were it possible for the Admiralty to offer a limited number of scholarships at Dartmouth, to rank equivalent with, or higher than those for Public Schools, this objection would be removed. The preparatory schools would then be willing to send up their best boys for the Navy, which is not the case at present, and the tendency would be for the standard of candidates for Dartmouth to be raised and for the supply of suitable candidates to increase instead of to diminish.

It is probably a sound plan to keep going both the Dartmouth and Public Schools methods of entry. The Special Entry method is far more economical, possesses the great advantage of being capable of rapid expansion when necessary, as on the outbreak of war, and at the same time permits the entry of boys who at the earlier age were, perhaps, unfitted by health or other reasons to join the Navy, and who would otherwise be lost to the Service. This method also renders it far easier for the Selection Committee to decide whether a boy is likely to prove suitable than can be possible when he comes up for interview at the age of about 13, and thus less wastage due to the admission of unsuitable candidates is likely to ensue.

At the same time it is only right that the preparatory schools should be given the opportunity of sending up boys for the Royal Navy, and this they can only do where the age of entry is roughly that at which a boy normally leaves his preparatory school, as is the case with the Dartmouth method of entry. For the same reason entries from the Mercantile Marine Training Establishments should also be continued, but it is to be hoped that in the future, it may be arranged that the two main sources of supply of candidates, namely, from the Dartmouth and Public Schools methods of entry, may be drawn upon in more equal proportions, and not, as is the case at present, with so great a preponderance from the former.

THE DEVELOPMENT OF CHEMICAL WARFARE.

By MAJOR E. R. MACPHERSON, O.B.E., F.R.G.S., R.A.O.C.

I. INTRODUCTION.

THE effective employment of poisonous gases or vapours is popularly supposed to have originated with the Germans; this, however, is not the case, as history records the fact that the Spartans, when besieging the cities of Platea and Delium (429 B.C.), saturated wood with pitch and sulphur and burned it below the walls of the cities in the hope of choking the defenders. Also the stink-pots of the Chinese and Malay pirates are well known.

Later, Lord Dundonald, who had been struck by the deadly nature of the fumes of burning sulphur in Sicily in 1811, strongly urged that these fumes should be employed for the reduction of the fortress of Sebastopol. His suggestion was, however, rejected by the Government as "horrible," and that "no honourable combatant would use such a device." This view was formally accepted at the Hague Conference of 1907, when the signatories agreed to renounce the use of projectiles the sole object of which is the diffusion of asphyxiating or harmful gases. Research into the possibilities of their offensive use and of defensive measures against them was, therefore, deliberately avoided by the chief signatory Powers.

II. DEVELOPMENT OF INDUSTRIAL CHEMISTRY.

The rapid development of modern industrial chemistry and of mechanical science was, nevertheless, rendering gas warfare a practical possibility for any nation that might choose to break its pact at the Hague Convention. One need only consider the main economic uses of some of the chemical substances that figured in the late war, or of their immediate precursors, in order to see the truth of this. Chlorine was made economically in large quantities before the war, but in England it was almost entirely converted into bleaching powder.

Phosgene plays an extremely important rôle in the commercial production of many of the important dye-stuffs, as well as in the synthesis of such drugs as urethane derivatives and salol, and this side of the chemical industry had become the monopoly of Germany.

Dichlor-ethyl-sulphide was prepared by the Germans in plant which had formerly served for the production of synthetic dyes.

The "Official History of the War. Medical Services," has been extensively quoted where necessary.

Cyanides, in the manufacture of which Great Britain held a strong position before the war, are largely used in the extraction of gold from its ores, as well as the electrical-plating industry. Stannic chloride has considerable commercial value as a mordant in the dyeing of calico.

Potentially, therefore, there was poison enough available; all that was lacking was the will to use it and the skill to adapt industrial chemistry and commercial organisation to the ends of warfare. Germany, of necessity, started with a great advantage in this respect. The care with which she had fostered the great chemical industries stood her in good stead when she threw discretion to the winds and adopted a method of warfare which had always been repugnant to men who believed in observing a code of honour in warfare.

The great chemical works in Germany, such as the Bädische Anilin- und Sodafabrik at Ludwigshafen, the firm of Meister, Lucius und Brüning at Höchst-am-Main, the Bayer Company at Leverkusen and the Griesheim-Elektron Chemische Fabrik possessed unrivalled facilities for meeting the military requirements of the Great General Staff.

Some of the more potent toxic substances or their precursors were produced in considerable quantities before the war in the synthetic dye and drug industries—industries which Germany had made peculiarly her own, and the plant necessary for producing these substances could readily be extended or adapted from what was already in existence. Further, the great facilities for research and the financial support offered in the laboratories of these works and in the Universities of Germany had led in the past not only to the discovery of a large number of chemical products of direct and valuable service to mankind, but also, in the course of extended investigation, to the identification of many substances of little more than theoretical interest at the time, some of which had proved to be violent poisons or irritants.

When the Germans embarked on their policy of gas warfare, the knowledge that had been acquired in the past was recalled to mind, and the selection of such substances as dichlor-ethyl-sulphide and the organic chlorarsines, which played so large a part in the last 18 months of the war, was undoubtedly based upon the information which had resulted from systematic research in years gone by in the province of organic chemistry.

The problem was, however, a very different one for the Allies. The British had always held a leading place in the manufacture of acids, alkalis and bleaching powder, but, in common with the French, had neglected the dye industry, and had little or no experience of the commercial production of even the precursors of the organic poisons to which reference has just been made.

Phosgene was not manufactured in England before the war.

III. INTRODUCTION OF TOXIC GASES INTO MODERN WARFARE.

The use of toxic gas in the World War, however, dated from the 22nd April, 1915, when the Germans launched the first cylinder attack

at Ypres, employing chlorine. The indignation aroused when the Germans initiated gas warfare only stimulated their opponents to face the situation with greater courage and obstinacy. Naturally, defensive measures took precedence at first, though almost at once preparations were started to retaliate in kind, for, while effective defence went far towards frustrating the enemy's efforts, more than this was needed if the *morale* of the troops was to remain unimpaired and the confidence of the enemy in his own superiority was to be shaken. New factories had to be started, new plant designed and erected, and the intricacies of manufacturing processes mastered before there was any hope of facing the enemy on equal terms. Yet the French retaliated on the Germans with dichlor-ethyl-sulphide within 12 months of the original mustard gas bombardment at Ypres, and the British supplies of this poison were beginning to be received three months later. Throughout the entire period of gas warfare, defence and offence struggled for the mastery, and the introduction of protective respirators and other defensive measures only stimulated efforts to defeat their purpose. Some gases were used in the hopes that they would penetrate the respirator; others, because it was felt that the absence of strong odour or immediate irritant properties would cause troops to underestimate the danger and so fall victims to the insidious action of the poison. At the same time new methods of liberating the gas were developed in the hopes of increasing the chance of surprising the enemy. On the defensive side, every effort had been made to forestall all new offensive plans by appropriate extension and alteration of defensive measures. Thus, it came about that both sides were forced to develop an extensive defensive and offensive organisation to deal with the problem of gas warfare in all its aspects, whether at the seat of war or in the munition factories, whilst an additional burden was of necessity thrown on the fighting troops by frequent changes of anti-gas equipment and the repeated issue of fresh instructions as the opposing sides altered their methods of offence and defence in their efforts to gain ascendancy with the new weapon. Though one must give credit to the Germans for the skill with which they made use of their resources to develop the offensive side of gas warfare, gaining a long lead in the design and production of gas shell, it may certainly be claimed that, so far as defensive measures were concerned, the British held the leading place, for the successive alterations of the British respirator ensured in every instance that it was ahead of the German offensive developments.

IV. CLASSIFICATION OF WARFARE GASES.

Though poisonous gases and vapours may, under appropriate conditions of administration, have a widespread action throughout the body, and affect a number of different organs simultaneously, they usually produce their most marked effect on some particular structure, especially when they are present in low concentration

Their action, therefore, may in some sense be regarded as specific, and it is possible on this basis roughly to classify the gases used for offensive purposes during the war into groups according to their most prominent action. Such a classification is by no means rigid, for each of the gases really partakes of the character of two or more groups; however, it has the merit of convenience.

The following is the accepted classification :—

	Characteristic.
(1) <i>Acute Lung Irritants.</i> e.g., Chlorine and Phosgene	Penetrant.
(2) <i>Lachrymators.</i> e.g., Xylyl Bromide and Methyl-chlorsulphonate (both used by the Germans)	Non-persistent.
(3) <i>Paralysants (i.e., direct poisons of the Nervous System).</i> e.g., Sulphuretted Hydrogen	Non-persistent.
(4) <i>Sensory Irritants</i> (sometimes called sternutators owing to liability to cause sneezing). e.g., Diphenyl-chlorarsine and Diphenyl-cyan- arsine (both used by the Germans)	Non-persistent.
(5) <i>Vesicants.</i> e.g., Dichlor-ethyl-sulphide (mustard gas, or "Yperite," the French appellation being derived from the sector where it was first used)	Persistent.

Broadly speaking, the gases in groups (1) and (3) may be regarded as lethal gases, and those in groups (2) and (4) as irritants, though only temporarily; whilst the vesicants of group (5), though intensely poisonous, have, even when used against troops that are well disciplined in defence against gas, a casualty-producing power enormously in excess of their killing power. It is difficult to realise at first what an enormous volume of gas has to be liberated in the open air to obtain even a small percentage in the atmosphere breathed. Statistics of the war revealed that as many as 10,000 rounds of 18-pounder (filled with persistent gas) were necessary to produce a neutralising effect (wind and weather being favourable) over an area of a thousand yards square.

When gas is set free, even the gentlest breeze ensures that it must become mixed with an immense volume of air, and upward currents and eddies in the atmosphere dependent on differences of air and ground temperatures and of the contour of the land, soon spread the gas vertically, with the consequence that the concentration of the gas in

the air diminishes fairly rapidly as the distance to leeward from the point of emission is increased. Owing to this, the concentrations of gas that one is called upon to deal with in warfare are likely to be of the order of 1 or 2 parts in 10,000 in the case of substances which exist as gases at ordinary temperatures, or are very easily vaporised owing to their low boiling-point; and of 1 or 2 parts in 1,000,000 in the case of vapours of liquids of high boiling point, save in close proximity to the point where the gas is actually liberated. It is evident, therefore, that warfare gases must be able to exert a toxic action in extremely low concentration if they are to be of any value. It is a matter of considerable difficulty to determine with any approach to accuracy the minimum concentration necessary for military purposes.

This naturally varies greatly according to whether a fatal effect or only temporary disablement is desired. Moreover, the figures are liable to be influenced by differences of individual susceptibility to the action of the poison, and attempts to deduce the toxicity for man from experiments on the lower animals are rendered uncertain owing to the widely different susceptibilities of different species. The duration of exposure to the poisonous atmosphere is also a matter of great importance. Some gases are definitely cumulative in action, and in these cases the concentration of the gas is of far greater significance than the duration of exposure.

V. DEVELOPMENT OF GAS WARFARE IN THE GREAT WAR.

In order to appreciate the sequence of the different stages of gas usage in the war, it might be convenient to divide them up into the following periods:—

(i) *Cloud Attacks from April, 1915, to August, 1916.*

Six German attacks with cylinders were delivered in April and May, 1915, at Ypres with Chlorine, and a further six similar attacks were delivered between December, 1915, and August, 1916; on the 19th December, 1915, Phosgene was mixed with Chlorine.

(ii) *Lachrymatory Shell Period. April, 1915, to 1916.*

Tear gases were first used in the early cloud attacks by the Germans.

(iii) *Lethal Shell Period, July, 1916, to July, 1917.*

Gases chiefly used were Phosgene, di-Phosgene, and Chloropicrin.

(iv) *Mustard Gas Period, July, 1917, to November, 1918.*

The famous Yellow Cross (Mustard), Green Cross (Phosgene and Chloropicrin), and Blue Cross (Chlorarsines), were used against us.

(v) *Projector Gas Period. July, 1917, to May, 1918.*

This new method of discharging gas was first used by us in July, 1917, and later by the Germans in December of the same year. From

July, 1917, to end of December, 1917, the Germans fired no less than 1,000,000 rounds of Mustard gas, representing 2,500 tons of the actual liquid.

It is interesting at this juncture to examine the British gas casualties of the war.

In May, 1915, we had over 7,000 casualties from the first "Cloud Attack," but by December of the same year our anti-gas measures had made such strides that our casualties were just over a 1,000, and kept below that figure during subsequent "Cloud Attacks," except on 27th April, 1916, when that figure was slightly exceeded. The mortality of the cloud gas attacks was 24 per cent. A certain number of casualties occurred during the Lachrymatory period, but none died.

During the Lethal gas period, our casualties in any one week kept well below one thousand, with a mortality of 6 per cent.

The Mustard Gas period claimed over 160,000 victims with a comparative small mortality of 2.6 per cent.

The total gas casualties of the whole war from April, 1915, to November, 1918, were as follows:—

Casualties	...	180,983	} = 3.3 per cent. fatal.
Deaths	...	6,062	

The strain caused by continual attack with gas, the personal discomfort, and the reduction of fighting efficiency caused by the wearing of anti-gas respirators, and the knowledge that a cloud gas or projector attack may kill many men in what is an affair of but a moment or two without any risk to those who have released the gas, so that only ceaseless vigilance can prevent a heavy toll of casualties, are factors liable to undermine seriously the *morale* of even the best troops.

When this is realised, and that, apart from desultory gas shelling, there were over 35 distinct gas battles on the Western Front, the comparative small number of the British casualties reflects the highest credit on our defensive organisation.

VI. PRESENT ACTIVITIES AND FUTURE POLICY.

The Press is constantly reminding us of the "gas peril" under such disturbing titles as "Dew of Death," etc. However, even allowing for the tendency to sensationalism in order to provide "copy," we cannot quite shut our eyes to the fact that a good deal of activity is taking place in certain European countries.

That byword, "Industrial Germany," hints at comparatively harmless development in laboratories and factories along purely commercial lines.

Moreover, as the writer endeavoured to show in the second paragraph of this article, how can restrictions be imposed on legitimate commercial industries, which, harmless though they be in times of peace, can, on the outbreak of hostilities, be diverted in a very short

time into producing chemicals suitable for war? It is certainly a problem teeming with difficulties.

Industrial Germany to-day, though admittedly hampered by economic difficulties, is still a potential war machine, highly organised, and *ready to be mobilised* should the military necessity arise. The "unrivalled facilities for meeting the military requirements" still exist and it is not apparent how they can be controlled.

The present activities of the German chemists are well known, and the Press inform us of their "new secret gas," which they allege has the characteristic of attacking directly the acoustic nerve of the ear, which controls the sense of equilibrium.

The present activities are not confined to Germany. As is well known, the Chemical Department at Moscow has developed surprising energy in studying poison gases. The Russian chemists allege that "chlorine combinations" have proved most useful for combating blight in corn in the East. Certainly, a very accommodating asset! Bethman Hollweg's famous slogan in 1914, "Not kennt kein Gebot" (Necessity knows no law) still epitomises to-day the attitude of certain Powers; and despite the "gesture" against the use of poison gases in warfare which was so prominent at the recent Washington Conference, we have got to face the unpleasant fact that chemical warfare will be a dominating feature in the next war.

General Fries and Major West (U.S.A.), in their admirable book,* sum up the situation very briefly in the following words:—

"Gas cannot be abolished. Poison gas in the world-war proved to be one of the most powerful of all weapons of war. For that reason it will never be abandoned. It cannot be stopped by agreement, because if you can stop the use of any powerful weapon of war by agreement you can stop all wars by agreement."

It might be remarked, in parenthesis, that we were signatories at Washington to the pledge not to employ poison gas in future wars.

Poison gas can be produced quickly, is easily transported, and can be used against an enemy with comparative ease by aircraft. Modern civilisation has become a struggle for existence, and in a war to-day every inhabitant of the belligerent countries is, *ipso facto*, involved in the conflict, and every acre of the countries at war becomes an integral part of the Theatre of Operations.

International Law will be violated in the future as easily as in the past, by those who may be inclined to do so. A close study of the situation to-day seems to indicate that the *main* strategic and tactical employment of poison gases appear to be developing on the following lines:—

(a) *Strategic*.—A "surprise new gas" will be employed by the aggressive power, probably *immediately* on the rupture of diplomatic relations.

* "Chemical Warfare," by Fries and West.

(b) *Tactical*.—By means of aircraft, the objective being the hostile capital and industrial nerve centres. In other words, a *coup d'état* will be attempted to shatter the *morale* of the nation and bring her swiftly to her knees. Marshal Foch, the clearest military thinker of our generation, emphasises this vividly. He says: "It is clear that aircraft attack on a large scale, owing to its crushing moral effect upon a nation, may impress public opinion to the point of disarming the Government and thus become decisive."

Should the attempt prove abortive, "normal gas warfare" will probably develop on accepted lines. The following remarkable paragraph appears on page 380 of Fries and West's book:—

"*Sprinkling*.—But this is not even the beginning of the use of gas by aeroplanes. Mustard gas, which is one-third again as heavy as water, and which volatilizes far slower than water, may be sprinkled through a small opening such as a bung hole in a tank that simply lets liquid float out. The speed of the aeroplane will atomize it. In this way, gas can be sprinkled over whole areas that must be crossed in battle. The Lewisite, of which we have heard considerable, will be used. It is less persistent than the mustard gas, but like mustard gas it produces casualties by burning. Unlike mustard gas, however, the burns from a quantity equal to three drops will usually cause death. The material can be made up by hundreds, even thousands, of tons per month.

We are working on clothing that will keep it out just as we have been and are working on clothing that will protect against mustard gas. But these gases are so powerful that if any opening be left in the clothing the gas will get through, so that even if we get clothing that will protect, it must cover every inch of the skin from head to foot. Besides, the mask must be worn at all times.

Consider the burden put on any army in the field that would have to continually wear such complete protection. What a strain on the mentality of the men! As before said, to endure it at all we must train our men to think of such conditions, to face them in peace, and in order to do so we must actually use gas. Just as in the World War the highly trained Caucasian outdistanced the savage in endurance, just so will the most highly trained men in the future outdistance all others in endurance."

Without dilating on this nightmare presented by our American cousins, it envisages every dump of ammunition and supplies, every dépôt on the Lines of Communication, in fact every military installation, becoming contaminated by this "Sprinkling." Thus, the Ancillary Services are faced with a new set of problems with regard to anti-gas methods, and the General Staff will have to devise new schemes of pro-

tecting military stores and dumps. "*Staff Officers must think of gas in every problem,*" has become an axiom.

It is a matter of doubt if the aggressive Power would be able to maintain the use of the "surprise gas" after the initial attack or attacks. This "surprise gas" would have to be prepared in carefully guarded plants, and owing to its very special preparation, could not be supplied in unlimited quantities. Therefore it is logical to assume, that after the first outburst, should the necessity arise, well known gases will be used that can be produced in sufficient quantities by existing commercial plants. Probably, a gas with vesicant properties.

The reply to (a) above appears to indicate a strong air arm of great offensive power, with a wide radius of action, whilst our normal policy should be based on fostering, developing and mobilising our national resources.

The writer would even go further, and suggest for serious consideration, that as chemical warfare has ceased to be an experiment, and has now become another auxiliary arm of the Service, it should be controlled by its own Directorate, with one head, responsible for co-ordinating the training in peace of all arms in gas warfare; the last war clearly proved the necessity of this.

A highly organised industrial system capable of being mobilised and centrally controlled, is the best reply to the activities of certain of our Continental neighbours.

THE EVOLUTION OF ANTI-TANK DEFENCE.

By CAPTAIN G. L. KAYE, M.C., R.F.A.

FIRST DEVELOPMENT.

WHEN the tank first made its appearance in 1916 it was soon seen that, apart from mines, the only weapon which could definitely deal it a knock-out blow was the gun. Naturally, some guns could undertake the task better than others. The field gun, on account of its mobility, its easy handling, its quick rate of fire and its direct laying facilities, was the most useful. It provided the necessary penetration against the thickness of armour then employed. Nevertheless, the fear of the shell of almost any nature of gun or howitzer hung like the sword of Damocles over the unwieldy war-tank. Guns were then available in numbers far surpassing the scale of moving war. This profusion of artillery weapons, moreover, rendered possible the use of a large proportion of field guns as pure anti-tank weapons with no other rôle in view; such guns could be specially sited for the part and remain inactive for all other purposes. It is generally agreed that this condition can only be expected to occur in a highly-developed form of static warfare.

FURTHER DEVELOPMENTS.

As the reliability and radius of action of tanks improved, these engines of war continued to gain successes in spite of specially sited anti-tank field guns. There would thus seem to be three main reasons for their later successes in 1917 and 1918, *i.e.*, surprise, increased numbers, and covering fire. Surprise attacks forestalled the siting of the anti-tank guns; even when the latter were in position and in action against large numbers of tanks, they were only able to knock out comparatively few before being overwhelmed by covering fire and smoke from guns, aircraft and tanks. It is true that field guns were, at that time, badly handicapped as to the number of tanks they could deal with by not having the wider traverse embodied in the latest type of mounting. In addition, the use of smoke enabled the attacking tanks to arrive almost on top of their objectives before being observed. The lack of traverse on the gun was barely counterbalanced by the restricted power of observation possessed by the earlier types of tank. Moreover, a gun with its detachment was far more easily seen even by that type of tank, as it lumbered into view up a short rise, than one man posted in a hole with a much smaller and more portable weapon. It thus came about that the side lacking this new engine of war produced the anti-

tank rifle. This more or less served its purpose in those days. It gave a certain amount of confidence to the infantry holding the front, and the inclination to run away whenever tanks appeared was appreciably less strong than at first. The heavy machine-gun which, when firing armour-piercing bullets, could penetrate tank armour at short range, would have added to this confidence, and soon the hail of rifle and automatic fire, directed at the loopholes and gun ports of the tanks, would have made the business of manning its weapons not so easy as was often imagined. In spite of all and in the end, tanks won the day against war-time devices, chiefly through the ingenious employment of surprise, the active support and co-operation of other arms and a gradually improving knowledge of how best to use them.

POST-WAR DEDUCTIONS.

Certain deductions may be drawn from this review of tank action during the Great War. Firstly, the gun was the only practical antidote to the first-born tank. Secondly, an infantry anti-tank gun gave vastly-increased confidence to that arm. Thirdly, our armies, except in a few isolated cases, were never threatened by this new and much-dreaded weapon. Perhaps it is difficult for us to conjecture the precise feelings of the enemy. Can it be realised what additional "heart" it gives to men holding the front, to be able to rely upon an effective weapon in the forward areas, close at hand and manned by *personnel* of their own unit? The German infantry learnt that guns, even though only a little way back, were comparatively sparsely distributed and could not carry out the whole task alone, however watchful and efficient they might be. But, it may be argued, there are more guns still further back, and these will deal with the tanks that get through. In fact, the further the tanks drive in, the more resistance they will meet. This seems but cold comfort to the sore-tried infantry in front. Is it to be accepted as a principle that penetration cannot be prevented? Is it not somewhat dangerous to neglect the possibility that the gap—for gap it must be, even though a small one—made by the few that do get through may be quickly exploited by the attacking infantry, who will reinforce the ground where success is first gained? Dispositions for defence must be carefully organised. The counter-tank attack must come like lightning, or the damage will be done.

LATER STATE OF AFFAIRS.

Shortly after the war a composite brigade was given a trial. A proportion of tanks and of the old machine-gun corps was included in its organisation. For various reasons the idea was apparently abandoned. But the problem of anti-tank defence can scarcely have been seriously considered. At least, it must have been taken for granted

that the artillery would supply it. Nevertheless, the composite brigade had its own anti-tank defence in the shape of the tanks which formed part of it.

The next development was a very natural demand on the part of the infantry for an anti-tank weapon of their own. They were beginning to realise their almost complete helplessness against tanks. Something was badly wanted to take the place of the tanks in the composite brigade. The result was that trials were commenced with a heavy machine-gun or pom-pom capable of penetrating the tank armour. At the time of writing, little is known as to the final results, and further experiments are being conducted. Nevertheless, the ultimate success of this machine-gun against tank armour is held by some to be about to revolutionise both anti-tank defence and tank tactics. Details of penetration and nature of projectile are not yet available, yet, in the absence of further information, it is difficult to believe that such a small weapon will be capable of stopping any tank that may be met with in the future, decisively and in sufficiently short time. One must always look ahead, and there must be an ample margin of superiority where the gun *versus* armour is concerned. Such a weapon will presumably only be effective up to short ranges, possibly limited to five or six hundred yards. It is obviously the ideal thing to be able to stop tanks at arm's length. At ranges of over a thousand yards, opportunities of doing so may be few; but where the chance is offered, a more powerful weapon than the $\frac{1}{2}$ -in. machine gun will surely be needed. Evolution seems to indicate that there may have to be different types of weapons to attack different types of tanks. As far as the infantry are concerned, this is the situation at the present time: they are completely dependent on the other arms for protecting them. Let us, therefore, consider what the "other arms" can do.

THE ARTILLERY.

Many trials and experiments have been carried out in this branch of the Service since the war. There are only three types of gun, so far designed, that are at all suitable for the engagement of tanks. These are:—

- (a) 18-pdr. Mark V.
- (b) 18-pdr. Mark IV on a Vickers platform.
- (c) 3.7-in. howitzer.
- (d) 3-in. anti-aircraft gun.

At present these alone possess sufficiently quick and wide traverse to compete with a moving target over open sights.

- (a) The 18-pdr. Mark V has proved itself a very efficient anti-tank weapon. Given the most favourable conditions, it should be able to knock out several tanks—perhaps four to eight—with

50 rounds in about five minutes. It might be well at this stage to discuss what these favourable conditions are :—

- (i) Sufficient visibility for good laying over open sights.
- (ii) Field of fire up to about 2,000 yards. It must be remembered that at ranges under 1,000 yards, tanks may be expected to bring their own guns into effective play, and may cause deterioration in laying and service of the gun.
- (iii) Speed of tanks not exceeding 15 miles per hour.
- (iv) Rate of fire from 12 to 20 rounds per minute.
- (v) Immunity from hostile fire.

The two most important conditions, viz., good visibility and field of fire, seem seldom likely to be obtained. Tanks will certainly attempt to attack in half-light, twilight, haze, or when covered by smoke; they may frequently appear in view at very short ranges. It can then become a question of which weapon gets a round off first. The senses of sound and vision here become all-important. The tank is a large object, and its noise may frequently give it away before it actually comes into view. But the din of battle may conceivably on occasions drown the drone of its engines. Large assemblies of tanks have taken place up to about 1,000 yards from the nearest enemy post without detection. To prevent further advance being disclosed, recourse has been had to artificial means of drowning their noise, viz., low-flying aircraft and gun fire. Seismographic instruments or the like are scarcely a consideration of the immediate future; in any case, they are not likely to be found in front-line posts. On the other hand, the gun and its detachment, if well concealed, may be difficult to detect even at a short distance, especially from the inside of a tank; though the new form of turret on top will increase the power of vision. In any case, having due regard to future improvements in this direction, the smaller the target that is presented to the tank the better.

To have the requisite field of fire, guns must either be specially sited in commanding forward positions—and for all other purposes remain silent—or be situated so far back as seriously to diminish their usefulness in the close support of the infantry they are covering. In the latter case also they are definitely not in a position to defend the infantry main line of resistance at all. It is generally admitted that there are not enough 18-pdrs. in a division to dispose sufficient numbers in specially sited silent positions and, at the same time, to retain an adequate number in their normal battle positions covering the front.

What number of tanks may be expected on the divisional front in moving war? The whole of their available number would probably not arrive with the first wave. But the front of an attacking division would generally be narrower than that of one on the defensive. Perhaps the maximum number likely to be thus employed would not exceed two battalions (about 140 tanks). Our system of defence should contemplate the employment of this maximum number on the part of a potential

enemy equally well armed as ourselves. According to the present war establishments, there are only 36 18-pdrs. and 12 3.7-in. howitzers in the divisional artillery. In order to provide anything approaching a reasonably secure defence by the artillery alone and at the same time the normal covering fire, these numbers would have to be doubled. Reinforcement by one Army Artillery Brigade would not appreciably ease the situation, which is obviously unsatisfactory in this respect. It may be argued that the best way to employ the divisional artillery is by using the mass of it against the most dangerous objectives, which in this case are undoubtedly the hostile tanks. There may be something in this contention, but it is a point which can only be decided by the General Staff, in view of both general and local conditions in battle. If a C.R.A. could guarantee to stop two battalions of tanks by using all his 18-pdrs. and 3.7-in. howitzers, that assurance could only be given on the clear understanding that the only artillery left available for harassing, covering and counter-battery fire would be the 12 4.5-in. howitzers, together with any reinforcing artillery that may be allotted to him. Further, if the attack was then checked, the majority of the anti-tank guns, all of which would, presumably, by that time have disclosed their positions, would be pinned to their ground. Directing their fire on to other objectives might thus be impossible, and any additional help they might be able to give in support of counter-attack or otherwise would be entirely produced by individual effort and at the probable cost of losing most of them. But, apart from all this could the assurance be given at all? It would be a rash claim to make for every gun would be useless if it could not see to fire in time, and the enemy will do his utmost to bring this about.

It is patent, then, that a reserve of motorised 18-pdrs. capable of firing off their transporters would be of great effect. They could probably be got up in time to defend the infantry, without having to be in position beforehand. They could closely support our own tank counter-attack.

Nevertheless, it would be a waste of powerful artillery *matériel* if the armour of the attacking tanks could be successfully engaged by a lighter weapon.¹

Guns of Accompaniment.—Until recently it was hoped that the gun of accompaniment would, in its rôle of intimate support, be suitable

¹ The 18-pdr. Mark IV can be provided with all-round traverse by being mounted on the Vickers platform. Certain minor difficulties due to the combination of laying and traversing being done by two individuals, instead of by one, make it on the whole inferior to the 18-pdr. Mark V. Nevertheless, the all-round fire renders it superior at short ranges, when lateral movement of the target becomes greatly accentuated.

The platform itself is very heavy, and takes time to put down. Such impedimenta could not be carried in a horse-drawn battery, but possibly motorised batteries could undertake their transport. A certain number would have to be carried in the divisional ammunition column, for which extra vehicles would have to be provided.

as an anti-tank weapon. To the 3.7-in. howitzer was allotted this rôle. In the light of recent experience this hope has not been altogether realised. For purposes of intimate support of the infantry this howitzer is useful; but in its present state it cannot be called a success in the dual rôle for these reasons:—

- (i) So far as is known at present, it is problematical whether its shell will penetrate 1-in. armour if complete detonation does not take place. If it does detonate, no penetration can result. Nevertheless, detonation on the surface of the armour may put the crew inside *hors de combat*.
- (ii) The gun on its present mounting is unsteady, when firing with full charge at low elevations.
- (iii) It is questionable whether the equipment would stand continuous firing of this nature for any length of time in war.

It may be possible to overcome some of these difficulties by using special light fixed ammunition for anti-tank work only, and by making certain modifications and improvements in the design itself consistent with changes in its mode of transport. The 3.7-in. howitzer is a powerful little weapon, when used as it is intended to be used; but as an anti-tank gun it is mis-applied. The crux of the matter clearly is that up to the present the construction of a weapon designed for close support has followed directly opposite lines to one designed for anti-tank work. The chief considerations for the former were lightness and a steep trajectory to clear obstacles in order to provide concealment; all these are obtained by low velocity and varying charges. For the latter purpose a high velocity is needed to give penetration, and this again entails a flat trajectory. Reluctantly, it must be admitted that this type of howitzer can only be regarded as a "stop gap" for anti-tank purposes.

Its present performances might perhaps be noted.

Owing to its lower velocity and consequent longer time of flight when compared with the 18-pdr., its useful range for tank engagement does not exceed about 1,200 yards. This in itself is no great advantage, as the gun is easier to conceal and would normally be closer up; but at present the detachment is more exposed. The rate of fire would seldom exceed 10 and normally average 5 to 8 rounds per minute. The matter of penetration has already been mentioned; 1-in. armour may be met with in tanks of future construction. One must look ahead, and have something in hand.

The considerations regarding their siting and employment are very similar to those affecting the 18-pdrs. Obviously they cannot all be placed in the front line. Their normal positions will be close up, but, although these batteries are being re-organised on a semi-draught, semi-pack, basis, it will seldom be possible to run them up to the "crest" in time.

Much has been said, and a certain amount already written, on the results likely to be gained by motorising these guns. Undoubtedly,

increased mobility would add enormously to their usefulness. At present they are slow moving. They could use this increased mobility much better to help break up a tank assault. But the carriage must provide all-round fire. Though possibly unable to penetrate heavily-armoured tanks, their shell might damage the tracks so as to stop them. Yet it is doubtful if motorisation is worth while in their case.

It must be admitted that this is not the legitimate use for the 3.7-in. howitzer. A great many more of them would be required to constitute a really effective defence, even when backed by 18-pdrs. If it is anticipated that a gun should be employed in this manner on a mechanical carriage, then the weapon itself, in design and construction, should more nearly meet the requirements of an anti-tank gun. Its calibre could be less, its velocity greater and its ammunition fixed. Glimpses into the future seem to disclose the probability that mobility of a high order will be needed. The life or death of the anti-tank gun and its crew will depend on the speed with which the gun can be trained and the first round got off. The ideal gun should also be able to accompany tanks in the attack. The sportsman in a circular butt on a foggy day, and ignorant of the direction of the "drive," must be a very high-class shot to down a "brace." The tank will appear anywhere and at any moment. Hence, an all-round field of fire and lightning handling are essential for the gun after a rapid move to the threatened spot.

If such a gun as this, by virtue of its great mobility and immunity in crossing bullet-swept ground, can at the same time be proved suitable for the close support of infantry, then the very existence of the divisional pack brigades may well be jeopardised. The 3.7-in. howitzer is a powerful and expensive equipment, requiring highly-trained *personnel*, while it remains of too short a range for a modern light howitzer. If, with the anti-tank *rôle* eliminated, there must still be a separate weapon for close support, then this future weapon should surely be as cheap and as easy to man as possible—in a word, the mortar. If the light mortar comes into its own again, and the divisional pack brigades disappear, who will then man the mortars? There is here matter for much argument, but it is outside the scope of this essay.

Anti-aircraft mobile guns have proved their ability to engage tanks, when called upon to do so. But, obviously, these guns can never be employed for this purpose except in an emergency. They might be useful against tanks which had penetrated deeply and were threatening important localities, such as headquarters, etc. But their assistance would be no more than that given by any other gun of whatever nature in a like case; for every type of artillery equipment in position on the field of battle must be prepared to engage any hostile tank that comes in view of the guns. Suffice it to say that, by reason of their design and equipment, they have a better chance of hitting quickly than other nature of gun not specified in this discussion.

Other Means.—Land mines and tank traps have been used and

will be used again. But, even granting the possibility of successfully placing mines in rapidly-moving warfare, this result cannot by any means be depended upon, and may not always be desirable. If the battle becomes stabilised for any period by the skilful employment of mines, it may be possible to deny certain ground to attacking tanks and force them to cross other ground, which can well be defended by anti-tank fire from more or less protected localities.

Lastly, it must be emphasised that every nature of artillery must be prepared to engage hostile tanks which have broken through and approach in view of a battery. Preliminary arrangements must be made for this contingency in every position. Organised artillery concentration of fire would invariably be directed against places where tanks are likely to assemble, as well as against possible avenues of approach; but this cannot be done haphazard without due warning of impending tank attack. Ammunition is not plentiful enough.

CONCLUSIONS ON PRESENT-DAY STATE OF AFFAIRS.

1. The 18-pdr. Mark V is by far the best and only really satisfactory anti-tank gun so far in evidence, but it is difficult to conceal. There will not be enough of such pieces to be used for the defence of the forward area. To do so with these alone would require practically twice their present numbers. They are most effective at engaging tanks, so to speak, at arm's length, and it is wasting their power to employ them for "short rise snap-shooting."

2. A few 18-pdrs. mounted on self-propelled track carriages would form a very valuable mobile reserve for meeting the heavier natures of tanks. They could probably arrive at the threatened points in time to defend the forward area. It is well to note that, if supplied with side armour, they practically become tanks, or tank "destroyers." They could then accompany tanks and infantry in the attack over bullet-swept ground.

3. The 3.7-in. howitzer is not suitable. But with certain improvements it may be a subsidiary means, at least, in rendering tanks immobile. At present, at any rate, they are not themselves sufficiently mobile.

4. The infantry weapon—heavy machine-gun or pom-pom—has not yet materialised, but may revolutionise the whole problem. On the other hand, it may not.

5. The ideal weapon seems to be a gun, self-propelled on a track carriage, as light and small as is compatible with the necessary power of penetration, while possessing an all-round arc of fire. It must be both an offensive and defensive weapon, capable of use for the intimate support of infantry as well as an anti-tank gun. For this object, and for temporary periods of purely passive defence, it must be removable from its mechanical carriage, and then adaptable to a ground pivot mounting. The gun and mounting together might be dropped off the carriage, or

the ground mounting carried separately on the mobile carriage. Mechanical details do not appear insuperable.

6. In any organised system of defence, traps and mines must come into the general scheme and be made full use of.

TYPES OF TANKS.

It is considered that the types of tank likely to be encountered in the near future come under three categories:—

(1) *The Cavalry Tank*.—Capable of travelling up to about 24 miles per hour; lightly armoured; armed only with machine guns; used normally in reconnaissance with cavalry and only exceptionally in big organised attacks. In short, the armoured car of the future.

(2) *The Infantry Tank*.—Armour anything up to 1 in.; maximum speed about 15 miles per hour; armed in addition with a 3- or 6-pdr. gun; presumably the lightest effective anti-tank weapon against light and medium tanks. This type would form the bulk of the Tank Corps armament, and must therefore be expected in any engagement—often in large numbers

(3) *Heavy Tank*.—A potential tank destroyer. Armour up to 1½ in., rendering it proof against light and medium tanks; armed with a gun probably not less than 8-pdr.; speed limited to 8 miles per hour. Few in numbers, and principal rôle the attack of other tanks.

SUGGESTED LINES OF FUTURE POLICY.

It appears fairly obvious that there cannot be only one means of defence against tanks. There may be occasions when such defence can be tied down to certain tactical localities, but more generally the bulk of it must be in the form of a mobile reserve. Undoubtedly, the ideal is that every arm should possess its own means of defence. The Great War taught us that not only every arm and every unit of that arm, but almost every locality, should have its own appropriate means of defence against aircraft. To this end we possess the automatic and A.A. guns, in addition to our own aeroplanes—the last being themselves armed with automatic weapons. The parallel is easy to draw in the case of anti-tank defence, namely, a light tank gun, the artillery motorised gun and the tank itself armed with a light tank gun. Now, if the infantry have gone so far as to relinquish their light mortars, they certainly will not accept light tank guns in their stead; nor, judging by recent events, will they have the least desire to take them over unless a reaction of feeling sets in.

It would be fatuous to enlarge on the rapid progress of science and mechanical armament on land and the consequent urgent necessity for all arms to take upon themselves the extra burden of more numerous and improved weapons of destruction in order to cope with this progress on the part of other nations. Our artillery certainly cannot be called

backward in this respect. The many, varied, weapons; new modes of transport and all that they imply; the vast number of scientific technicalities connected with the development of the arm—all speak for themselves. Yet the word has gone forth that the infantry should not be further burdened. Obviously, if the light tank gun is really needed as it urgently seems to be, both as a mobile weapon of offence as well as of defence, it must be manned by some specialist corps. This corps of specialists can only come into being in excess of present establishments. Furthermore, the weapon itself which it carries can very well be identically the same as the tank gun in the medium tank.

The problem to be faced is who shall man this weapon? Who shall form this new specialist corps? Obviously, if tanks were part of the infantry organisation, the question would be already answered. But they would only constitute a mobile defence, uneconomical as such, and could not at present provide passive defence anywhere for even half an hour.

ALTERNATIVE SCHEMES.

There seem to be several alternatives for the specialist corps, namely:—

- (1) The artillery allotted to intimate support of infantry, *i.e.*, the present Pack Batteries.
- (2) The Tank Corps—outside its tanks.
- (3) The re-embodied Heavy Machine Gun Corps.

Before discussing these schemes in detail, it is better to arrive, first of all, at some conclusion as to what number of these guns is likely to be required, since this applies generally to all such schemes. In the first place, the maximum number of tanks that may attack on a divisional front must be considered as a basis. This has already been suggested as two battalions (about 140 tanks). Secondly, on what scale can they be organised? One is here obliged to wander into the realms of pure assumption.

We have next to calculate how these guns are to be disposed—whether in position or kept mobile? How far their field of fire may be obscured in one way or another? How the nature of the ground may help in denying certain lines to tank advance? To what extent those already in action are liable to be overwhelmed by any preliminary concentration of artillery fire directed against the forward area?¹ What width of front is held per battalion in line?

For simplicity's sake, let us frame the answer to all these conundrums purely from the point of view of frontages: the normal battalion frontage in defence is about 1,000 yards, so it is reasonable to suppose that four light guns in this area should be ample. Following the system of two battalions per brigade holding the main line, the brigade organisation would require eight guns; the division twenty-four.² Whether it may

¹ This is a strong argument for keeping them mobile.

² The French division has only nine 37 mm. guns, but the corps troops include a regiment of tanks. These are essentially short range weapons.

be best to employ them in pairs and follow the lines of M.G. tactics, or singly, as in the case of artillery anti-tank guns, it is as yet difficult to offer an opinion. The numbers above proposed would allow a few in reserve, dispersed in depth, or kept mobile, when two brigades were in line.

It may be of interest to note that in the new German Field Service Regulations, *personnel* for anti-tank defence is to be supplied by light *minenwerfer* units. The nature of their equipment is not stated. The training of trench mortar *personnel* is believed to be still going on in the German Army, contrary to the policy adopted since the war in our own Service.

The various alternatives, therefore, will be discussed on the basis of eight guns per brigade and of a brigade organisation.

1. *Pack Artillery*.—The expansion of the artillery arm that would be necessary from the adaptation of this branch to the purposes of a special corps would be nothing new. It would result in an increase and provision of additional equipment to the "intimate support" batteries; this result could probably be brought about with the least upheaval in present organisation and establishments. This scheme appears plain sailing from the anti-tank point of view, but the weapon supplied to the batteries would never be used for that purpose alone; it must also be available to help both infantry and tanks forward in attack. It must, in fact, be a partial substitute for the Stokes mortar and the heavy machine-gun. Such an employment would appear to tend more towards that of machine guns than of artillery. In other words, the resultant tactics would be machine-gun tactics. If this be so, then they should surely become an integral part of the infantry brigade. This fact might cause difficulties, if the batteries were to remain artillery units. Their training would be different from all other natures of artillery. To reconcile these adverse elements might not be easy. A compromise would have to be devised, which might not be satisfactory to either arm.

2. *Tank Corps*.—The writer feels that in discussing the present status of this all-important branch, he stands on somewhat delicate ground. The tank is such a singularly unique and modern product of war that it was, perhaps, inevitable for it to remain for a time rather isolated from the older arms. It is true that the Air Force started by being an integral part of the Army from which it is now divorced. But the R.A.F. came into being much more gradually than the Tank Corps. The tank is essentially an offensive weapon. Its notorious weakness is that it cannot be used in a purely defensive manner for even the shortest space of time. It can win ground, yet it cannot hold it. The reason is not far to seek: it is at present inseparable from its weapons and fighting crew. It has come to be regarded as a fighting unit, which cannot be separated into its three components—mechanically-propelled armoured hull, weapons, and crew. If the tank itself, *i.e.*, the armoured

shell, is regarded merely as a well-protected carrier of arms and men it seems to open up a field for further possibilities. If, then, the Tank Corps were to form the specialists, and if the proposed weapon were to be identical with that now placed inside the medium tanks, two advantages are immediately unfolded. First, economy and simplicity of construction; second, a reserve of men trained to the weapon—technically but not tactically. The tactical training of reinforcements would, as always, present difficulties; it could only be undertaken with infantry.

3. *Heavy Machine Gun Corps.*—The re-embodiment of the old Machine Gun Corps into Heavy Machine Gun Corps companies affiliated to brigades seems to offer certain advantages. Such an organisation would be no new thing. The new companies would become more part and parcel of the infantry than artillery ever could do. Their training would be in close relation with that of infantry and of tanks. It would also seem desirable that the light anti-tank gun should invariably be supported by automatics. During the engagement of tanks by the anti-tank guns, these automatic weapons would provide valuable support by a hail of fire directed against the gun ports and loop holes of the tank. This result could not be assured, if they were sited for covering fire irrespective of the requirements of anti-tank defence. The position for a light anti-tank gun would often coincide with a good machine-gun position. Naturally the automatics supporting the anti-tank guns would undertake the normal rôle of machine guns as well. Finally, if the heavy machine-gun ever proves successful against light armoured tanks, it is suggested that a unit comprising these weapons and eight light anti-tank guns—one to be allotted to each infantry brigade—would form a most efficient anti-tank organisation. There seems no reason why this anti-tank unit could not be employed, both in attack or defence, in a very similar manner to that in which the old machine-gun company was used. It would constitute a self-contained brigade heavy machine-gun company. The burden would be taken off the shoulders of the infantry, and yet at the same time the new unit would be as closely associated with infantry tactics and training as possible. Reserves of men trained in the use of the two weapons would be found in like manner as was the case with the Machine Gun Corps during the Great War. At present infantry have a wholesome dread of tanks, and justly so, since at the moment these troops are almost entirely unprotected against the new engines. Adequate defence on the lines indicated would render infantry much more effective in action, and endow them with an improved morale due to the greater confidence produced by such a condition.

SUMMARY OF POSSIBLE MEANS OF DEFENCE.

To sum up the means of defence:—

- (a) A brigade heavy machine-gun company, consisting of eight light anti-tank guns, and not less than sixteen heavy machine guns, all mobile. The present Vickers gun might also be included.

- (b) Some motorised r8-pdrs.
- (c) Our own tanks, and especially a few heavy "destroyer" tanks.
- (d) Land mines and tank traps.
- (e) Heavy concentration of all natures of artillery fire directed against (i) possible tank assembly positions as soon as warning of any attack was obtained, and (ii) on approaches or flanks—as the case may be—at the moment of assault.
- (f) Immediate engagement of any tank that may have succeeded in breaking through, by every nature of gun which stands within sight and effective range.

The light anti-tank heavy machine-gun weapon, if designed for high angle fire also, would give the infantry an additional and useful defence against close reconnaissance aeroplanes of an armoured type. Expense cannot be pleaded as a reason for not making such provision, for, if adequate defence of this nature is to be provided, money will have to be spent in any case. The provision of a light anti-tank infantry gun would be certainly cheaper in the long run than an abnormal increase of the artillery of a division. If expenditure has still to be reduced, it may have to be considered whether the extra establishment required by, say, the first four divisions, will not have to be balanced by a reduction to nuclei of certain formations in the fifth division. The General Staff must pronounce as to which alternative it attaches the greatest importance.

A FEW OTHER CONSIDERATIONS.

To be forewarned is to be forearmed; but, however well prepared, there is no such thing as "certainty" in war. In most cases the nature of the *terrain* will definitely deny certain ground and localities to tank action. Thus, only certain sectors of front will be liable to be broken by tanks. Mass attack delivered against any such sector is likely to succeed up to a point, but the issue of the battle will be decided only after inter-tank action. The flanks, especially, are likely to be vulnerable. It is advisable, therefore, to prepare for this fact in the scheme of defence by not holding these sectors too strongly, with infantry, while remaining so disposed in depth as to form the new and necessary defensive flanks with the utmost rapidity when the break is followed up by hostile infantry. Above all, the maintenance of strong and very mobile reserves becomes even more imperative. Every available resource, intelligence and ingenuity should be applied to giving warning of such attacks. Our own tank destroyers and a proportion of medium tanks can then be pushed up in readiness. The moment the assault is launched, a tank action will probably take place. The more medium tanks that can be spared to operate at this juncture with the tank destroyers, the better chance there will be of breaking the attack of the hostile tanks at its commencement. But, generally speaking, it is likely that only a few such tanks will be available, the bulk being required for the counter-offensive. Some, however, will have to be sacrificed in a fierce tank engagement, in which it will be their duty to

obtain some measure of delay by putting as many enemy tanks as possible out of action. The infantry must be schooled to regard the tank in its true light, and not as an invincible monster. All those troops situated in positions exposed to the actual passage of tanks are indeed in a quandary, and, if the tanks get into close quarters, they have little chance of escape. The fewer troops that are thus exposed to destruction the better.

DEFENCE AGAINST IMMEDIATE COUNTER-ATTACK AFTER SUCCESSFUL ADVANCE.

The institution of the brigade heavy machine-gun companies on the lines indicated present possibilities of further development. If the weapons with which these units should be armed were interchangeable with the weapons in the medium tanks, a link would be forged between the two corps which might radically affect the employment of tanks themselves. Without technical knowledge, it is hard to say whether the tank gun can be made removeable so as to go temporarily on to a ground mounting. There is certainly no difficulty standing in the way of such a course in the case of the Vickers gun. But, if tanks can be so designed without seriously weakening the rigidity of their turrets, the resultant advantages can be easily pictured. Imagine an attack with tanks that is able to reach a locality on which it may be desired to consolidate. The tanks may be accompanied by none or very few of the surviving infantry platoons, together with a few carrier tanks containing reserves of anti-tank gun and machine-gun ammunition. At this stage, or for any length of time up to an hour perhaps, as is only too well known, the chief cause of anxiety is the immediate counter-attack—with or without tanks. Our tanks, or a limited number of them according to previous arrangement, unload their weapons and crews, under covering fire from the remaining tanks and perhaps a few motorised r8-pdrs. which have followed the advance. The drivers take the empty tanks back to the rallying points. The carrier tanks dump their ammunition and likewise withdraw.

Machine gun and anti-tank posts are now formed and, together with the few infantry platoons, if any, who may have kept up with the advance, the nucleus of a strong defence could probably be organised before the enemy's bombardment or counterattack begins. This defence is already prepared against tanks in anything except overwhelming numbers, a contingency which is unlikely in the case of an immediate counterattack. Meanwhile, the returning tanks, or rather a proportion of them, can refit with weapons and crews from the heavy machine-gun companies at the rallying points.

I have tried to show the possibility of merging the Tank Corps and the Heavy Machine Corps into a single flexible organisation, capable of fighting their weapons inside the tanks or outside. Such a view seems to offer a field for exploring new and untried systems which, if workable, would add greatly to the offensive and defensive powers of the division.

SOME TACTICAL ASPECTS OF FORMATION FLYING.

By MAJOR OLIVER STEWART, M.C., A.F.C.

AT one time the problem of "taming" the aeroplane and of training it to subdue its naturally undisciplined individuality and to play a part in a large fighting formation, appeared to be insoluble. At first the formation, through lack of unity, was no more effective than the single machine. Even now it is doubtful if twelve fighting machines together represent an effective power of much greater value than three single machines.

The extreme difficulty attending the effective concentration of a number of aeroplanes on a single objective is due to the nature of the machine and of the medium in which it works. War in the air is war in three dimensions, and the contestants, all the time, are travelling at extremely high speeds. Aerial battle, therefore, presents many novel and unique problems for the student of tactics, and it is essential to regard it quite separately from all other kinds of battle.

Owing to the scarcity of authoritative pronouncements upon formation flying in warfare—no standard work upon the subject exists—it is necessary first of all to seize on the basic principles which underlie the efficient concentration of a force of aeroplanes upon a force of enemy aeroplanes. Let this inquiry be limited in its initial stage to the scout patrol of six machines.

The object of the scout patrol is to seek out and to destroy enemy aircraft. First and foremost, therefore, it must embody in its disposition the power of striking with its full weight at a fraction of a second's notice. Secondly, inherent in its disposition and as an inseparable adjunct to the power of striking must be the power of defence. Thirdly, in consequence of the swiftness and complexity of the fighting, it is necessary, if any co-ordination is to exist between them, for the aeroplanes to be disposed in a manner which will allow freedom or "air room" for the most generous manœuvring that may be required in attempting to gain a tactical superiority over the enemy. Fourthly, cohesion during this tactical manœuvring is essential.

How may the aeroplanes be placed so that the formation possesses initial striking power, power of defence, power of manœuvre, and cohesion in battle?

Since the scout can shoot only straight ahead in its line of flight, it is clear that, in order to obtain striking power or concentration of fire, no aeroplane in a formation must fly immediately behind any other aeroplane. The stringing out of the machines in line ahead, therefore, is, ruled out at once. The disposition of the machines in line abreast is also inadmissible, although for the different reason that it cramps the power of swift manœuvre.

Supposing that a patrol in line abreast is attacking an enemy formation by means of the simple dive. Quite apart from the extreme

and totally unnecessary difficulties of keeping anything approaching correct dressing in line abreast at the terrific speeds attained on the downward plunge, the sudden but controlled alteration in the direction or height of the formation as a whole which might be demanded to meet a defensive manoeuvre on the part of the enemy would be impracticable. In fact, of all dispositions, that in line abreast is the most unwieldy. The disposition of machines in line above—with each aeroplane directly over the next one—is obviously unsuitable tactically for a variety of reasons, one of them being the difficulty which would be experienced by each pilot in keeping the other machines in view. The three simple dispositions are, therefore, unsuitable for the patrol of scouts and it becomes necessary to turn to what conveniently may be called "compound" dispositions which combine differences in lateral, in vertical, and in fore and aft arrangement.

But before examining compound dispositions, the defensive needs of the scout patrol which, as it has been pointed out, must be partly fulfilled by the disposition of the machines, must be stated. The vulnerable part of a scout patrol is the rear; any machine in the hinder part of the patrol which is attacked must be able, therefore, to close up with its companions, no matter at what speed they are flying. It must be able to do this, of course, in order to obtain aid without disorganising the formation. How can the rearmost machines obtain this power to close up? Simply by flying higher than the leading machines, for then a dive may be employed to add to the speed obtained by the engine and so the aeroplanes in front may be overtaken rapidly. We find, then, that the rearmost machines must fly higher than the front machines. But we have found already that the machines must not be in line abreast nor in line ahead. By the process of elimination it now becomes clear that the only formation conforming to these diverse requirements is that which shows, in plan view and in front elevation, as a V; and, in side elevation, as "steps."

Take a patrol of six machines. The leader, No. 1, is at the point of the V. Nos. 2 and 3 are on his right and left rear, but higher. Nos. 4 and 5 are on the right and left rear of Nos. 2 and 3, but higher. No. 6 remains to be placed. No. 6 might be placed as a tail to the patrol behind all the others and higher. But the rear of the patrol, it has been shown, is its most vulnerable part, and to place a single machine behind all the others is, in effect, to weaken the formation's rear guard and therefore its power of defence. Consequently, No. 6 (who should be the sub-leader of the patrol) will take station roughly above and between Nos. 4 and 5. He would appear in plan view as midway between the top extremities of the arms of the V.

We now have a formation which can bring all its guns to bear at once, which, for its size, is highly manoeuvrable and in which the rear machines, by their disposition, are given the power to close up at an instant's notice. The normal distances apart of the machines is a matter upon which there is much divergence of opinion. It will be safe to say, however, that no two neighbouring machines should be

more than 50 yards apart, nor should they be less than 20 yards apart. Thus a certain latitude for individual manoeuvre is allowed and the whole patrol can be swung together when the leader turns. (In the space of an article it is impossible to describe the methods of turning by "crossing over," etc.).

The aeroplanes in the formation are now disposed with needs one and two, as enumerated above, fulfilled. They possess the power to strike forward and to defend towards the rear: and they also retain sufficient "air room" for manoeuvring during the process of striking. The leader is the point of the striker and the remainder perform the double duty of adding weight to his attack and defending him while he is attacking. This dual object, the embodying in the formation of the power to strike forward and the power to defend backward, is the essential condition aimed at in the initial disposition of every scout patrol, whether it be of three machines or if of thirty machines.

If, therefore, 18 machines were to be disposed in one close formation (and not in layer formation) it would be possible to form them in three groups of six, one group leading and one on either of its flanks; or in six groups of three, when a group of three would be substituted for each single machine in the formation already described. The method in groups of three has been advocated by many fighting airmen. And, when a certain aspect of the combat itself has been considered, one reason for the choice of this grouping will be evident.

And now the cohesion of the formation during the actual fighting, while rapid tactical manoeuvring is in progress, may be considered. How can the patrol be held together in the wild kaleidoscopic shock of battle between combatants travelling at perhaps 200 m.p.h.? when one second may see the increase of a range from 200 yards to 400 yards, and when half a minute, which may be taken up in engaging an enemy machine, may be long enough for the remainder of the patrol to have flown so far away as to be completely out of sight even on a day with a high degree of visibility.

A very clear and broad rule is essential if the formation is not to be scattered and its strength dissipated during a battle. It would be possible to instruct the pilots in the formation to regain their stations relative to the patrol leader whenever the opportunity to do so presented itself; but, in a patrol of six or more machines, this inevitably leads to confusion.

The leader is turning and twisting quickly in his efforts to obtain a decisive burst of fire. Now, obviously, if they are to keep station, the rearmost machines must travel much farther during each manoeuvre than the foremost machine. But the foremost machine, during the fight, is in all probability employing the maximum speed and climb which it possesses. The rearmost machines in the patrol of six, therefore, must continually cut corners, and otherwise depart from their exact stations if they attempt to keep closed up, and these departures cause confusion and disorganisation, besides being totally inadequate to achieve their end.

The inevitable result, if a patrol of six or more attempts to keep station in its original disposition, is confusion and disintegration, and no exact mass formation like that in which the patrol enters the fight, can be maintained for one quarter of a second during the fight.

But it has been said that a measure of cohesion is essential and a method must be found to obtain it. If the formation of six is too unwieldy to keep together when once the combat has been joined, it must be split up into two formations of three each, and this in fact is the practical solution. As soon as possible after the combat has been joined, two aeroplanes attach themselves on either flank of the leader and two on either flank of the sub-leader. The sub-leader, as long as he is able to do so, keeps near the leader although without maintaining a definite relation between their positions, and the patrol of six is thus broken up into two units of three; each unit being almost as manœuvrable as a single machine and being in itself a complete formation embodying striking power and defensive power.

And here the basis of formation tactics has been indicated. *The unit of three machines is the foundation of the tactical method employed for "in-fighting" by scout formations.* "Nos sorties," says Capitaine René Fonck, who brought down 126 enemy aeroplanes during the war, "se continuèrent désormais en formation triangulaire par groupes de trois ou quatre. Mes pilotes me gardaient des attaques venant d'arrière et pour ma part j'avais la responsabilité du reste du ciel." He employed the V formation with the aeroplanes grouped in threes or fours, and he, the leader, acted as the striker while the remainder of the patrol defended him from attacks from the rear. (To avoid giving a false impression, it must be added that Fonck, and—so he once told me—Guynemer, believed the use of the formation to be strictly limited. They achieved most of their victories when flying alone.)

It will be seen that the grouping and arrangement of the aeroplanes is, as it were, continually trying to keep pace with the extreme rapidity of their manœuvre. The machines in a formation of six are disposed to make the patrol as agile as possible; but, even so, when the combat is joined, a further change to two groups of three is necessary in order to meet the increased complexity and instability of the conditions. The three is the scout aeroplane unit. Similarly with the very large formation: it will enter the fight in a certain disposition and, when actually engaged in in-fighting with the enemy, it will split automatically into groups of three.

The aspects of formation flying which have been examined may be summed up thus: the formation, when it goes out and when it is in the act of striking, is disposed in a V with the machines at different heights so as to give the maximum concentrated power of striking forward and of defending towards the rear. But, after the combat is joined, the formation must, of necessity, sacrifice concentration to manœuvrability and cohesion. The machines remain together, but they act in a number of separate self-contained groups and not as a single mass.

CORRESPONDENCE.

[Correspondence is invited on subjects which have been dealt with in the JOURNAL, or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, and publication of letters will be dependent on the space available in each number of the JOURNAL.—ED.]

TACTICAL TRAINING OF THE TERRITORIAL SUBALTERN.

TO THE EDITOR, R.U.S.I. JOURNAL.

SIR,—One of the greatest defects that can come to light in any non-regular body of troops is the lack of tactical ability among its junior officers. Thus, during the Great War after six months of training at home and some months spent in the field, the junior Territorial (or Militia) platoon or company commander was found well able to hold his own with his regular *confrère* in most branches of his military duties. So, for instance, he could handle and instruct his men; he generally possessed the necessary courage, determination, and discipline; lastly, in a set battle, when his task was limited to leading his command behind a barrage on to an objective, and then, after taking it, to hold it, he would fulfil such a task admirably. None the less it was manifest, even at the end of the Great War, that in open fighting under fluctuating conditions which called for any sound tactical knowledge and power of decision he was very often quite at sea, and—what was worse—he would realise this fact himself.

If illustrations of this truth were needed, it should suffice to quote two cases which came under the writer's own observation. In both instances the officers had benefited from long training at home—as much as three or four years; they had, in addition, been employed in training other officers. In the first case that was observed, a strong German trench had been occupied, whereupon the officer in question was detailed to hold a section of it and received explicit instructions to look after a German communication trench which might provide a suitable approach for counter-attack. When this officer's dispositions were subsequently inspected, it was found that a Lewis gun section had been installed in the communication trench itself with just 10 yards' field of fire down the trench: the corporal in charge of the gun was naturally and thoroughly apprehensive as to what might happen if a German bombing party should suddenly appear. The officer responsible for these dispositions, however, seemed thoroughly surprised when his arrangements came to be criticised adversely.

In the second case, an officer was ordered to attack a strong point under cover of a barrage. Against all specific instructions, he led his men down a trench, instead of extending them; he placed his stretcher-bearers immediately behind himself, and gave his Sergeant, who was at the rear of the party, no instructions. The officer himself was hit, and the stretcher-bearers stopped to attend to him, whereupon the entire party came to a halt. It was not until some minutes later that the Sergeant heard anything as to the cause for the check. Then when he endeavoured to lead the platoon forward once more, the barrage was right ahead and the attack failed.

In both these cases the mistakes were quite elementary; they showed a complete ignorance of the art of handling even a platoon on active service. The

cause of this defect is not hard to find. Tactical decisions should be, for the most part, taken intuitively rather than as the result of deliberate reasoning. In battle it is hard to reason logically. The private does his work in battle because his mind and muscles have been so trained that he will, by sheer force of habit, obey his orders rather than his reasoning fear. In the same way, his officer, when confronted with any unforeseen tactical situation, should be able to arrive at the correct solution and carry it out, again by sheer force of habit rather than by a process of thought. Rudyard Kipling has made the whole thing clear in the following lines:—

"They have so utterly mastered their work that they work without thinking;

Holding three-fifths of their brain in reserve for whatever betide.

So when catastrophe threatens, of colic, collision or sinking,

They shunt the full gear into train and take the small thing in their stride."

The regular officer acquires this intuition or habit of mind through his training in successive stages from the platoon to the division, which occupies a third of his military year.

Let this curriculum be compared with that undergone by the Territorial officer. What do we find? Of the very limited time at the disposal of the latter, he must spend at least nine-tenths thereof in training his men (and being taught to train his men) in the rudimentary work of the private soldier: musketry, drill, march discipline, outposts, guard duties, etc. He goes through perhaps one or two field exercises a year, three or four tactical exercises without troops, and, if he is conscientious, he may diligently study his training manuals. But it is a commonplace that nothing can be easier to learn than the principles of tactics while nothing is harder to put into practice.

In addition, his efficiency will be judged by the appearance of his command on parade. Any mistakes he may make during the infrequent field exercises in which he takes part may possibly never be noticed, or, if remarked upon, may escape with mild criticism. If, on the other hand, he should club his platoon on parade, he will be informed of his deficiencies, and so will his brother-officers. Not unnaturally, he may come to regard himself a reasonably efficient officer, even if his tactical knowledge is practically negligible. The writer once met such an officer, who thought himself a perfect platoon commander; so did the writer until it was found that this paragon could not read a map.

This fundamental difference was once clearly illustrated in 1914. A regular officer, who had already made a name for himself in the field, came to lecture to the officers of a newly-raised unit, mostly University men of brilliant attainments, who drank in the instruction like a sponge. In the course of his remarks, the lecturer told a thrilling story of the doings of his regiment in the Retreat from Mons. But his theme was all about *what* was done, and not *why* it was done. One too eager listener put a question to that effect to the speaker directly who at once replied, "Of course, we did so and so; what other action could we take?" The fact is that he knew his work so well that he did it, not only without thinking, but almost without knowing why he acted in a particular fashion. His audience dispersed, interested but disappointed. Here again, then, resides another difficulty. The regular officer has the knowledge to impart, but often not the ability to impart it; while the senior Territorial officer may have the ability to impart, without the knowledge of his subject. There are, of course, exceptions to both the above statements.

Since the war, this need for sound tactical training has been further intensified both by specialisation of sections within the platoon and by the more varied

weapons with which the infantry is equipped. The platoon commander now has to be able to instruct his section commanders, who will themselves often be called on to make tactical decisions on their own initiative. Yet it is not easy to see what can be done to increase the tactical efficiency of the Territorial subaltern. The majority of these officers can but rarely have the time to learn their tactical work, as is done by the regular officer, through the constant handling of their commands on manoeuvres. Something can be done by means of exercises on paper, held under their C.O.'s or adjutant's supervision, and on sand models or large-scale maps. These, at any rate, will allow these officers to judge their relative efficiency and progress, and whether they are working on the right lines. Nevertheless, such exercises will necessarily be comparatively infrequent; and it will, in any case, be impossible to acquire a habit of mind from them alone. The only remedy thus seems to lie in the hands of the officers themselves. They must be encouraged to train themselves in "thinking tactically." They should be urged constantly to devise little problems for themselves on country walks, during a round of golf, on the march, and on the barrack square. This, of course, requires a considerable degree of imagination, not given to all men, and especially to those (now constantly on the increase) who have not seen active service, since such men do not know what is, and what is not, possible under fire. This imaginative effort should, therefore, be assisted in every possible way. At present, however, should an officer desire to exercise himself in this fashion, the number of books to which he can turn for help is remarkably limited. A few problems in minor tactics are put forward in the pamphlet entitled "Section Leading in Attack and Defence"; a few more may be found in "A General's Letters to his Son." But these do not take into account some of the more recent weapons with which a platoon is now armed. "The Defence of Duffer's Drift" remains a classic, but suffers from a similar defect. Some more ambitious schemes are contained in the booklet, "Problems of Minor Modern Tactics," but the writer does not know how this can now be procured. Even putting these authorities together, they will be found to contain not more than twenty or thirty situations in all. What is wanted is a book containing 200 to 300 exercises, which should be very simple and should cover all the more normal tactical situations in which the junior officer may find himself on active service. It should contain not one problem, but ten or more, dealing with each situation. Each exercise must be provided with a solution and comments showing how the principles laid down Field Service Regulations and Infantry Training can be applied to every particular situation. Such a book would also permit the Territorial officer to multiply the exercises by applying them to the country in which he lives; while at the same time it would stimulate his imagination and force him to think out tactical problems for himself. Such a system of training can, of course, only prove a poor substitute for the actual handling of men, but it is suggested as the best that can be obtained, given the unavoidable limitations of an Army that will only very exceptionally be mobilised. Issued with authority and officially brought to his notice, such a manual would at least arouse some thought as to the importance of tactical training, and would provide a good basis of knowledge on which—after mobilisation—the responsible instructors can build as soon as training facilities for intensive tactical work become available.

Yours, etc.,

C. L. TEBBUTT,

Captain,

R. of O., 1st Cambs. Regt.

OLD MILITARY CUSTOMS.

TO THE EDITOR, R.U.S.I. JOURNAL.

SIR,—The lecture given by Major Tones on Old Military Customs still extant, breaks ground which, although it should be of great interest to all soldiers, does not seem to be cultivated as much as it should be. Hence it is that the origin of not only army but also of regimental matters is often lost.

One possible origin of the salute was not touched upon by either the lecturer or by Mr. Fortescue, namely, the Oriental form of salutation of putting dust on the head, which is also combined with the symbol of shading the eyes from the brilliance of the superior's countenance. This form of salute was probably taken from the Saracens and was clearly noticeable in our Army when the shako was the universal infantry headdress. It is still maintained in both the German and Turkish armies, in which it is, or was, the custom to keep the hand in that position the whole time when standing in front of a superior.

Our custom of opening the palm to the front has been introduced within the memory of many till quite recently serving, so there should be some documentary evidence available amongst the records of the War Office, since doubtless—when the regulation form of salute was altered on the introduction of the helmet—a committee assembled to consider this point amongst others.

Regarding the form of the salute with the sword, the explanations given can be still further amplified. Granted that the "recover" represents "kissing the Cross," was not the salute on the march originally symbolic of the whole sign? First the hilt was brought to the right breast, then carried across to the left, then raised to the mouth, and, lastly, sunk a little before lowering the blade. The custom of the Crusader offering his sword to his Sovereign before going into battle is Oriental and still obtains in India, for, when an Indian officer is first promoted, he offers his sword hilt foremost for his British officers to touch; he also does this when introduced to any distinguished person.

An old custom like this can easily disappear. A case could be quoted of one commanding officer who considered this quaint little ceremony was unnecessary and ordered that, when the newly promoted I.O.s came round to pay their respects they should merely salute in the regulation manner. In the same battalion, when men were promoted or the N.C.O.s got a step, the morning after the promotions appeared in orders they came round and offered the difference of a month's pay on a silk handkerchief, which was touched and remitted. This was also abolished, but both customs came back later. It is more than likely that, owing to the great changes that have taken place amongst the officers due to the transfers, casualties and disbandments during and after the late war, many old customs will have been lost: so every effort should be made to record them before they are forgotten.

How many officers now serving know that the colour party fixing bayonets, when an escort to the colours, is a relic of the time when the colours went into action and the sergeants lowered their halberds to protect the ensign when the line advanced at the "charge"?

In the unit in which I served nearly thirty years, though colours were officially abolished thirty-five years ago when it was turned into Rifles, the colours are still retained and carried on the ceremonial parade when the recruits are sworn in on completion of their instruction. The lads are brought up in batches, lay their hands on the King's colour and take the oath of allegiance in the presence of the whole battalion, although they have all previously taken it on enrolment. When all have been sworn in, the colours are held so as to form an arch, and then the

recruits march under them in file, saluting as they do so then take up their arms and fall in on the fourth side of the square, after which the parade is dismissed.

It is a pity so little is known about the formation of messes as a regular institution for peace time. That they were formed on service can be gathered from many old diaries, and some evidence should be available from similar sources or old order books of which there may be a few still in existence, if they could only be found. Probably they came into being about the year 1800, for the writer, although he has taken a constant interest in regimental plate, has never seen a piece with an inscription, *connecting it with the regiment*, previous to 1800. A very interesting thing belonged to the old 8th Madras Infantry: it is a little silver Indian-made elephant, which was picked up after the battle of Assaye. A silver howdah, forming a snuffbox, was mounted on its back, and on the edge of this was engraved the name of every officer of the regiment who took part in the battle. This unit was disbanded and reformed as a Gurkha battalion, which was first numbered the 8th, then the 10th, and finally the 7th. Oddly enough last year the writer met an officer of the 7th in France, when the conversation turned on mess plate, and he was pleased to hear that the elephant was still in that mess, and was better pleased to be able to tell its history which was not known to its present owners.

The Society of Army Historical Research has, for some considerable time, invited contributions regarding regimental plate, customs, colours, etc., but so far, the response has been exceedingly meagre. One knows but little about bands, or "musick" as they were called: when was the "jingling Johnnie," or Turkish chimes, first carried, and what regiments carry it still?

Is there any old table of drum calls in existence? There should be, for the "Rogue's march" was used in the memory of men still alive in India.

Mr. Fortescue stated that all our bugle calls were composed by Haydn. A great many were altered, not to make them more melodious, after the South African war: who composed the substitutes, and why? Barrack calls were not used in the field even in South Africa so as not to be heard by the Boers.

One would like to know the reason for some of the slight differences in uniform; for instance, why do some Highland regiments wear the sash over the sword-belt and some under it? Why does the 2nd Black Watch wear the kilt pleated the reverse way to others? Why do the pipers in some Scottish regiments march round the mess table against the sun, instead of with it?

The difficulties of making research into such matters are, no doubt, great; but sometimes one meets with success.

The officer who raised the Sylhet Local Battalion, now 1st Batt. 8th Gurkhas, died in 1825; I tried to get a portrait of him, and also to obtain particulars of his service. The India Office told me who he was, but could trace nothing of his war service. Still, the little I was told enabled me to get into touch with four different branches of his family, from whom, unfortunately, I could learn nothing except that he was believed to have been one of Napoleon's escort on board the "Bellerophon," and this could not be verified. The result of about 10 years' fitful enquiries produced nothing of regimental interest, but it certainly put various members of the same family in touch with one another.

One C.O. of ours was killed in action about 70 years ago, but no one knew where he was buried. In 1909 I found an old pensioner who had actually helped to carry him to his grave. Further enquiries located the grave, which had only been marked by a number. Later I met a man in Scotland who was related to this officer and had one of his medals, and his likeness. I suggested that they should be given to the regiment, whereupon the portrait was presented, and I was told the medal should be bequeathed to it. Nine years later an officer of

another battalion, knowing my interest in such matters, wrote to me asking if I could tell him anything about a medal which had been left to his unit, for he had never heard of the recipient of it before. I could and did, pointing out a mistake that had evidently been made in the will. The result was he took over the medal and passed it on, so now it is in its proper place; but in other circumstances we might never have got it.

The Digest of Services is an admirable means of keeping history up to date; but a very interesting appendix might be added to every one, containing notes on the mess plate, trophies, old customs, etc., which would be of great use to succeeding generations.

It may seem strange, but the native ranks of the Indian Army often know more about the ancient history of their unit than do many of their British officers. A few units still remain from the time when they were, like the British, known by the names of their commandants.

Not very long ago I met a native officer of the 3rd Brahmins on a railway station, and, not being able to see his shoulder straps, asked him what corps he belonged to. I did not catch his reply, so asked him what he said. He gave the number of the regiment again, and, by way of explanation, added "Gatree" (Guthrie). What officer or man of the "King's Own," if asked a similar question, would amplify his answer with "Barrell's"? The Indian is much more conservative than the British soldier in this way. What could be more interesting to a soldier than such articles as are asked for by the Society of Army Historical Research? Surely many officers could contribute something, and, if so, why don't they?

Galloway House, West Burton,
Aysgarth, Yorks.

J. ALBAN WILSON,
Lt.-Colonel.

THE SITUATION IN THE PACIFIC.

TO THE EDITOR, R.U.S.I. JOURNAL.

SIR,—Having been a resident on the Pacific Coast of Canada for a number of years I have been favoured with an advance copy of Major Ferguson's lecture.

I desire to congratulate the lecturer for the very valuable work he has produced and for the insight he shows. There are, however, two points on which I do not agree with him.

First, he says: "Russia is beginning to show signs of returning to the old Muscovite policy which we associate with the Tsarist régime, and will probably close Siberia to the Japanese unless they are prepared to fight for it, which is out of the question." I would suggest that the recent Russo-Japanese Trade Treaty will reverse the supposition.

Second, he says: "If Japan were to fight Canada or Australia for the right of immigration, the United States of America would join in with our Dominions and vice versa."

I am quite convinced that if Japan were to fight the United States of America, the Dominion of Canada would not join in with the latter. The whole tendency and inclination of Canadians at the present time is to keep out of any and every war whatsoever.

Yours, etc.,

FREDERICK V. LONGSTAFF,

Convener, Marine and Shipping Committee,
British Columbia Historical Association.

23rd March, 1925.

NAVY NOTES.

ROYAL UNITED SERVICE INSTITUTION.

Attention is invited to the following extract from an Admiralty order which relates to this Institution:—

"Their Lordships desire it to be known that they wish to give every encouragement to Officers to join the Institution and to take part in its Essays, Lectures and Debates."

LENDING LIBRARY.—A further Admiralty Order states:—

"Arrangements have been made whereby Members of the Lending Library of the Royal United Service Institution, serving abroad, may obtain books at such stations to which the Admiralty official letter bags are sent; books so issued must be returned in the same way."

"The total period for which such books are issued is not to exceed six months (China, eight months)."

"Copies of the Library catalogue can be obtained on application to the Librarian, price 5s. 6d."—(A.F.O. 1512/21.)

GREAT BRITAIN.

THE KING'S CRUISE.

H.M. the King has been afloat in his yacht for a Mediterranean cruise to recuperate after his illness. He has been accompanied by H.M. the Queen. Their Majesties left Buckingham Palace on the morning of the 19th and crossed from Dover to Calais in the Channel steamer "Biarritz," reaching Genoa by train at 4.30 p.m. on 20th March. There was an absence of ceremony.

H.M.S. "Victoria and Albert," commanded by Rear-Admiral H. T. Buller, C.B., C.V.O., left Portsmouth on 7th March for Genoa, where the King and Queen embarked. Next day the yacht left Genoa, escorted by the destroyers "Vampire" and "Vendetta," detached for the purpose from the Fifth Flotilla, Mediterranean Fleet, and proceeded to Leghorn. On the 24th they left for Castellamare and Naples, since which their Majesties have visited other ports in Italian waters.

TOUR OF THE PRINCE OF WALES.

On Saturday, 28th March, H.R.H. the Prince of Wales embarked at Portsmouth in the "Repulse," Captain H. W. W. Hope, C.B., D.S.O., for a tour to British West Africa, South Africa, and South America. This will be the fourth Dominion tour he has made since the war. The "Renown," in which he travelled to Canada in 1919, Australia in 1920, and India and Japan in 1921-22, is in dockyard hands undergoing reconstruction; hence the choice of her sister-ship. Between 4th and 22nd April his Royal Highness visited places in West Africa, and on 30th April he was due at Cape Town, proceeding ashore until 22nd July. The Prince is to disembark to H.M.S. "Curlew" from the North American Station on 7th August, and, while the "Repulse" visits Mar-del-Plata, the "Curlew" proceeds to Montevideo from 7th to 9th August, and to Buenos Aires on the 10th, remaining there for three or four weeks.

NAVY COLOURS.

The King has approved the use by the Royal Navy of Colours corresponding to the King's Colours carried by Military Forces. They will consist of a silk White Ensign, 3 ft. 9 in. by 3 ft., with red, white and blue silk cord and gold tassels, carried on an ash staff, surmounted by a gilt badge consisting of Admiralty anchor on a three-faced shield with Crown superimposed. Colours are being issued to each Home Port, to be kept at the R.N. Barracks, and to the Commanders-in-Chief on the Atlantic, Mediterranean, East Indies, Africa and North American Stations. They are not to be paraded on board ship, but only by guards of honour for the King, other members of the Royal Family, foreign Sovereigns, etc., and on such important ceremonial occasions as may from time to time be ordered by the Admiralty or a commander-in-chief. The use of the White Ensign by naval landing parties is no longer authorised.

THE NAVY ESTIMATES.

The Navy Estimates for 1925-26 were presented to Parliament on Friday, 13th March. They show a net total of £60,500,000, as compared with £55,800,000 in 1924-25, exclusive of the Supplementary Estimate of £220,000 presented on 26th February for arrears of civil pay. Two sums of £1,320,000 and £50,000 represented charges appearing for the first time in Navy Votes on account of the cost of the Fleet Air Arm and of the work done for the Navy at the (Army) Experimental Establishment, Shoeburyness. A further net sum of about £1,500,000 was due to what the First Lord called uncontrollable causes, such as increases in wages and prices, the automatic growth of the non-effective votes, and reduction in the quantities of surplus war stores available for use without replacement, and in the expected receipts from appropriations-in-aid. These items account for considerably more than half of the net increase of £4,700,000 over the Navy Estimates for 1924-25.

NEW CONSTRUCTION.—The First Lord in his Memorandum (Cmd. 2366), in pointing out that the Estimates included no provision for the commencement of any new construction, said that "the Admiralty's proposals for construction for 1925-26 form part of a programme considered necessary during a period of several years in order to maintain the accepted standard of naval strength, the chief feature in the programme being the replacement of cruisers which have become or are becoming obsolete. H.M. Government is at present proceeding with the investigation which the late Government declared its intention of making into this question as a whole, and proposals as regards new construction will be laid before Parliament at a later date when the enquiry has been completed."

SINGAPORE, ETC.—Provision is made for the resumption of work on the naval base at Singapore, but there is no charge to this country in 1925-26 for this decision, as the Colonial Government of Hong Kong has generously subscribed £250,000 towards the cost of the base, being the profits of shipping control during the war.

The New Zealand Government has intimated its readiness to maintain a second cruiser of the same type as the "Dunedin," and the "Diomedé" is, therefore, to be transferred to the New Zealand Station in October next. The obligations of the Washington Naval Treaty as regards the scrapping of capital ships have been duly carried out. The "Australia" and "Monarch" were sunk at sea, and the remaining ships, 18 in number, representing some 400,000 tons of material, were sold to shipbreaking firms in this country. As recorded in the JOURNAL last quarter, the Naval Inter-Allied Commission of Control in Germany has been

withdrawn, the purely naval clauses of the Treaty having been completely carried out.

PERSONNEL.—As regards *personnel*, the First Lord, in some Notes on matters of general interest, showed that the total of 102,675 for 1925-26, an increase of 2,175 over that for 1924-25, includes most of the provision for the "Nelson," "Rodney," "Courageous," "Glorious," "Emerald," "Adventure," two destroyers and two patrol submarines, and for the Fleet Air Arm, after allowing for the *personnel* released by the scrapping, under the Washington Treaty, of the "Thunderer" and three vessels of the "King George V." class. Less than one-tenth of the numbers required for the five "Kent" class now under construction is also included. The remainder of the *personnel* for most of these ships would normally have been included, but for an enquiry which H.M. Government is instituting into the whole manning question. A committee is also to be set up to investigate the future requirements of officers with special reference to numbers and to the flow of promotion.

THE FLAG LIST.

THE LATE SECOND SEA LORD.—Vice-Admiral Sir Michael Culme-Seymour, Bart., K.C.B., M.V.O., Second Sea Lord and Chief of Personnel, died from congestion of the lungs following pneumonia on 3rd April. He had been a member of the Board for not quite eight months at the time of his death. There have been four generations running of Admirals Sir Michael Seymour and the heir to the late Baronet bears the same name. He is a naval cadet. Sir Michael will be sincerely missed by his many friends in the Service.

NEW SECOND SEA LORD.—Vice-Admiral the Hon. Sir Hubert George Brand, K.C.M.G., K.C.V.O., C.B., has been appointed a Lord Commissioner of the Admiralty, Second Sea Lord and Chief of Naval Personnel vice the late Admiral Culme-Seymour.

FLAG APPOINTMENTS.—Vice-Admiral Sir Walter H. Cowan, Bart., K.C.B., D.S.O., M.V.O., is appointed as Commanding Officer, Coast of Scotland, in succession to Vice-Admiral Sir Reginald Y. Tyrwhitt, to date 30th June, 1925. Rear-Admiral John Ewen Cameron, C.B., M.V.O., is appointed Rear-Admiral and Senior Naval Officer, Yangtse, in succession to Rear-Admiral David Murray Anderson, C.B., C.M.G., M.V.O., to date 8th August, 1925. Rear-Admiral David M. Anderson, C.B., C.M.G., M.V.O., has been appointed to be Commander-in-Chief, China Station, temporarily, in succession to Vice-Admiral Sir Allan F. Everett, K.C.M.G., K.C.V.O., C.B., who has been invalided home. Flag Captain W. J. C. Lake, commanding H.M.S. "Hawkins," has been appointed Commodore temporarily in command of the 5th Cruiser Squadron. Both appointments date 13th April.

Vice-Admiral Sir E. Alexander-Sinclair, K.C.B., M.V.O., is appointed as the new Commander-in-Chief, China, from 22nd April.

PROMOTIONS AND RETIREMENTS.—Further steps were taken during the quarter to reduce gradually the Flag List. On 18th January, Vice-Admiral Sir Henry B. Pelly, K.C.V.O., C.B., retired at his own request, in consequence of which Rear-Admiral Sir Reginald Y. Tyrwhitt, Bart., K.C.B., D.S.O., D.C.L., was promoted to Vice-Admiral, but in accordance with the decision to reduce, no further promotion was made as a consequence of this retirement.

A month later, on 17th February, Vice-Admiral George H. Borrett, C.B., retired at his own request, when Rear-Admiral Michael H. Hodges, C.B., C.M.G., M.V.O., was promoted to Vice-Admiral, and Captain Oliver Backhouse, C.B., A.D.C.,

to Rear-Admiral. Vacancies were thus filled in the normal manner on this occasion, but when next a change occurred a further reduction was effected. This was on 10th March, when Admiral Sir Ernest F. A. Gaunt, K.C.B., K.B.E., C.M.G., retired at his own request, and Vice-Admiral Sir Douglas R. L. Nicholson, K.C.M.G., K.C.V.O., was promoted to be Admiral. No further promotion from Rear-Admiral to Vice-Admiral or from Captain to Rear-Admiral was made as a consequence of this retirement.

Consequent on the death of Vice-Admiral Culme-Seymour, Rear-Admiral H. W. Richmond, C.B., Commander-in-Chief, East Indies Station, is promoted to Vice-Admiral and Captain R. B. C. Backhouse is promoted to Rear-Admiral.

The state of the Flag List at the end of March was: 11 Admirals, 20 Vice-Admirals, and 49 Rear-Admirals, as compared with 12 Admirals, 22 Vice-Admirals, and 59 Rear-Admirals in March, 1922, when it was decided to effect a gradual retrenchment, showing a net reduction of 13 officers.

PERSONNEL.

SHEERNESS COMMAND.—Captain Frederick C. Fisher, lately Captain of the Dockyard and King's Harbour Master at Malta, has been appointed to succeed Captain (now Rear-Admiral) Oliver Backhouse, C.B., as Captain-Superintendent of Sheerness Dockyard.

OFFICERS' MARRIAGE ALLOWANCE.—Vote 1, subhead "F," of the 1925-26 Navy Estimates, dealing with Marriage Allowance, provided for an increase of £431,050, which was stated to be due to an additional number of men entitled to the Allowance, and the "inclusion of new provision in respect of Marriage Allowance for officers." No reference to this concession was made by the First Lord in his Memorandum. The conditions governing payment had not been settled up to the end of March. During the Navy Estimates debate, Mr. Bridgeman announced that the cost of officers' marriage allowance would be about £350,000 per annum if Admiralty proposals were accepted.

OFFICERS' HISTORY EXAMINATIONS.—Subjects for the essays in the annual examinations for junior officers in Naval History in the years 1926-29 inclusive have been fixed. For 1926 the subject will be Rodney as a strategist and tactician; for 1927, Naval operations in the Mediterranean from 1793 to the English evacuation of the Mediterranean, with special reference to their influence on the campaigns on land; for 1928, Anson and his importance as a naval reformer; and for 1929, the strategy of the Anglo-Dutch wars of the 17th century. A list of suitable authorities is given in Fleet orders.

RESERVE OFFICERS' INCOME TAX.—It was notified in February by the Admiralty that officers of the R.N.R., R.N.V.R., and Special Reserves of Engineer Officers, R.N., and Royal Marines, are eligible for a rebate of income-tax in respect of the maintenance of their uniform, and, subject to the conditions set forth, allowances of £10 per annum for commissioned officers, and £7 per annum for commissioned officers from warrant rank, are authorised to be deducted from naval emoluments in order to arrive at "total income" for income-tax purposes.

NEW RETIRED PAY SCHEDULES.—New Orders in Council, dated 6th February, 1925, fix the rates of retired pay, pension, or gratuity that may be granted to officers retired under Order in Council of 21st April, 1922, for incapacity, peculiarity of temper, or other defect not amounting to misconduct; and for the retired pay, etc., of certain classes of officers retired for non-service under Orders in Council of 22nd January, 1920, and 15th March, 1922.

MATÉRIEL.

NEW CONSTRUCTION.—The programme for 1925-26 provides for the completion of the cruisers "Effingham," "Emerald" and "Enterprise," and submarines "L. 26" and "L. 27." The "Effingham," which was begun in April, 1917, is to be completed in July, 1925, to relieve the "Chatham" as flagship in the East Indies. The other two cruisers, of the new "E" type, were begun in 1918 and are to be completed in December, 1925, and March, 1926, respectively; they are then to relieve the "Colombo" and "Cairo" in the East Indies. Submarines "L. 26" and "L. 27" were laid down in January, 1918. When these and the cruisers are finished, there will be no vessels of war-time programmes remaining in hand.

Construction will be continued during 1925-26 of the battleships "Nelson" and "Rodney," laid down in December, 1922; the five cruisers of the "Kent" class, begun in 1924; the minelayer "Adventure," laid down in November, 1922; the destroyers "Amazon" and "Ambuscade," laid down in January, 1925, and December, 1924, respectively; and submarine "O. 1," began in March, 1924. Including the sums in the new Navy Estimates, £4,199,580 and £4,110,217 has been allocated to the "Nelson" and "Rodney" out of the six millions which they are each estimated to cost. Submarine "X. 1," the first fighting vessel of post-war design to be laid down for the Royal Navy, in November, 1921, is still carrying out trials, and on their satisfactory completion the vessel will be available for service. The revised cost of this submarine, excluding armament and ordnance stores, is £941,794, or three times the cost of a pre-war light cruiser.

RE-CONSTRUCTION AND REPAIRS.—Five ships are under reconstruction. They are the "Furious," "Courageous," "Glorious," "Warspite" and "Renown," of which the first three are being converted to aircraft-carriers. In the repairs list are fifteen cruisers; the aircraft-carrier "Argus," eight sloops, two ships for R.N.V.R. drillships, twelve minesweepers, 22 flotilla leaders and destroyers, and 13 submarines. In addition, one destroyer and eight submarines are to have large repairs at Gibraltar and Hong Kong respectively.

FLOATING DOCK FOR MALTA.—No. 8 (ex German) Floating Dock is being prepared for Malta. An additional section has been fitted to it at Chatham. This will enable it to dock the largest ship in the fleet.

ORGANISATION AND DISTRIBUTION.

DESTROYER FLOTILLAS RENUMBERED.—As from 1st April, changes took effect in the numbering of certain destroyer flotillas. The First Flotilla (Atlantic Fleet) became the Fifth Flotilla; Fifth Flotilla (Mediterranean) the First Flotilla; seventh Flotilla (Reserve at Port Edgar) the Ninth Flotilla; and the Ninth Flotilla (Atlantic Fleet) the Seventh Flotilla. The titles of the Second, Third and Fourth Flotillas in the Mediterranean, and the Sixth and Eighth Flotillas in the Atlantic Fleet, remain unchanged.

NEW DESTROYER FLAGSHIP.—The cruiser "Centaur," which has been under repair at Rosyth, was commissioned at Portsmouth on 8th April, as flagship of Commodore C. K. Maclean, C.B., C.V.O., D.S.O.—Commodore (D) Atlantic Fleet.

MEDITERRANEAN LEADERS.—The new flotilla leader "Broke" was commissioned on 21st January, at Pembroke, and has now taken over the duties of the ship of the Captain (D), Fourth Flotilla, in the Mediterranean, in place of the

"Montrose," the latter relieving the "Malcolm" as leader of the Fifth Flotilla, and the "Malcolm" returning home to the Nore Reserve. The new flotilla leader "Keppel" was ordered to be completed at Pembroke on 3rd April, to join the Third Flotilla, Mediterranean, replacing the "Spenser," which was to return home to the Portsmouth Reserve.

SUBMARINES FOR MEDITERRANEAN.—The Second Submarine Flotilla, consisting of the depot ship "Lucia," the "Adamant," tender, and submarines "L." 52, 53, 54, 56, 69 and 71, arrived at Malta on 8th February, having transferred from the Atlantic to the Mediterranean Fleet. Previously, there were no submarines attached permanently to that Fleet.

SLOOPS FOR WEST AFRICA.—The gunboats "Dwarf" and "Thistle," completed in 1899, are to be withdrawn from the West Coast of Africa and replaced by the sloops "Daffodil" and "Delphinium," which are refitting for tropical service at Pembroke and Sheerness respectively.

THE FLEET AIR ARM.

CHARGE TO NAVY ESTIMATES.—For the first time, the Navy Estimates of 1925-26 include a charge in respect of the cost of the Fleet Air Arm. This sum, amounting to £1,320,000, is credited in the Air Estimates as a grant in aid of the expenditure for which provision is made in those Estimates. The reason for this arrangement is explained in the First Lord's Memorandum. It has been formally laid down, on the recommendation of the Committee on the Relations between the Navy and the Air Force, that it rests with the Admiralty to formulate requirements for the Fleet Air Arm. Obviously, therefore, it also rests with the Admiralty to justify those requirements, whether they are challenged from the point of view of adequacy or of economy. It is this Admiralty responsibility which is duly recognised by including the charge in the Estimates for which the First Lord has to answer.

THE NAVAL AIR SECTION.—Captain Ralph Leatham, R.N., was appointed in January for temporary duty in the Naval Air Section of the Naval Staff, of which Captain T. F. P. Calvert, D.S.O., is the head. Provision is made in 1925-26 Navy Estimates for an increase of this Section, which in future will include two captains and two commanders R.N., instead of one of each rank as hitherto.

PILOTS' COURSE AT NETHERAVON.—Thirty officers were appointed to the second course, beginning on 12th January, for pilots in the Fleet Air Arm, at No. 1 Flying Training School, Netheravon, Wilts. Of this total, 21 were lieutenants R.N., including one specialist in gunnery, one in engineering, and one in torpedoes; two were sub-lieutenants R.N.; one was a mate R.N., and six were lieutenants R.M.

DATES OF FUTURE COURSES.—The dates of the third and fourth courses for pilots will be as follows:—Junior section, 27th April to 26th July; Senior section, 10th August to 9th November; Junior section, 10th August to 8th November; Senior Section, 23rd November to 22nd February, 1926.

SEA AIR WORK.—The aircraft carriers "Eagle," "Hermes" and "Argus" took part in the recent combined tactical exercises of the Atlantic and Mediterranean Fleets, and air work was an important feature of those exercises.

H.M.S. "FURIOUS."—The alterations to this aircraft-carrier, which have been very extensive and costly, are now practically complete and she has been

carrying out trials off Devonport. As reconstructed the vessel will resemble an enlarged "Argus" without funnels or superstructure. She will commission this summer with the crew of the aircraft-carrier "Hermes."

H.M.S. "PEGASUS."—This sea-plane carrier, which has been employed on special service in the Far East for the last ten months, is due home shortly. The "Pegasus" is the only remaining converted cross-Channel steamer. Her war service continued till 1919, when she acted as parent ship to the seaplanes attached to the Naval Flotilla covering the withdrawal from Archangel.

NAVAL OCCURRENCES.

ATLANTIC FLEET'S CRUISE.—The spring cruise of the Atlantic Fleet under Admiral Sir Henry Oliver lasted from 26th January, when the squadrons and flotillas left Portland for Gibraltar, Vigo or Cadiz, until 2nd April, when they returned from Gibraltar to Home Ports for Easter leave. While the greater part of this time was spent in the vicinity of Gibraltar, the ships also visited Cartagena, Algiers, Hyères, Almeria, Ferrol, Malaga, Huelva, Barcelona and Palma.

COMBINED FLEET EXERCISES.—On 14th March the Atlantic Fleet arrived at Palma, meeting there the Mediterranean Fleet under Admiral Sir Osmond Brock. The latter was practically at full strength, except for the "Iron Duke," absent under refit, and the cruiser "Concord," lent to the Australian Fleet, and the destroyers "Vampire" and "Vendetta" on escort duty with the royal yacht. The combined fleets under Admiral Sir Henry Oliver included 12 battleships, one battle-cruiser, 16 cruisers, 53 destroyers and flotilla leaders, 11 submarines, and three aircraft-carriers. With sloops and auxiliary craft, there were over a hundred pennants flying. Exercises were carried out during the week ending 21st March and were witnessed by the First Sea Lord.

WEST INDIAN CRUISE.—The Eighth Cruiser Squadron under Vice-Admiral Sir James Fergusson made a cruise in the West Indies during January and February. The whole squadron, consisting of the "Calcutta" (Flag), "Capetown," "Constance" and "Curlew," called at Belize on 13th-15th January, Jamaica from 18th to 25th January, and Barbados from 14th to 21st February. Individual ships visited Nassau, New Orleans, Key West, Trinidad, Demerara, Grenada, St. Vincent, Martinique, St. Lucia, Antigua, the Virgin Islands, St. Kitts, and Nevis. From Antigua, the "Constance," Captain C. V. Robinson, was detached on 22nd February for an independent cruise through the Panama Canal to ports in Chile and Peru.

PIRACY IN CHINA.—The First Lord makes reference in his Memorandum to the continuance of disturbances in China and the prevalence of piracy in the Yangtse and Canton Rivers, which have been a strain on the resources of the China Station. On 16th January, the British steamer "Wenchow" was heavily shelled by Chinese seven miles above Chinkiang, one shell just passing over the bridge, but the ship was not hit. She was, however, forced to return to Nanking, whence H.M.S. "Scarab" finally escorted the "Wenchow" and two other British steamers to Shanghai. Other steamers were reported to have been molested during the quarter.

VASCO DA GAMA COMMEMORATION.—The Battle Cruiser Squadron, consisting of the "Hood" and "Repulse," under Vice-Admiral Sir Frederick Field, represented Great Britain at the celebrations connected with the 400th anniversary of the death of the Portuguese navigator, Vasco da Gama. The event actually occurred on

24th December, 1924, but the commemoration was postponed for a month to enable British, Italian, French and Spanish warships to be present. The "Hood" and "Repulse" arrived at Lisbon on 23rd January, and left for Gibraltar on the 30th.

SINGAPORE CONFERENCE.—A conference between Commanders-in-Chief in China, the East Indies, and the Naval representatives of Australia and New Zealand began at Singapore on 3rd March. Such conferences were inaugurated before the war for mutual discussion as to means for possible co-operation in the event of emergency, and it is the Admiralty's policy to continue them about every two or three years. The last of the kind was held at Penang in March, 1921. The officers attending the 1925 conference included, for the first time, a New Zealand representative. They were: Vice-Admiral Sir Allan F. Everett (China), Rear-Admiral H. W. Richmond (East Indies), Rear-Admiral P. H. Hall Thompson, and Commodore T. E. Wardle (Australia), and Commodore A. F. Beal (New Zealand).

DOMINION NAVAL FORCES.

SHIPS FOR ROYAL AUSTRALIAN NAVY.—It was announced at Sydney on 24th March that the Australian Government has accepted the tender of Messrs. John Brown and Co., Clydebank, for building two cruisers in Great Britain at a cost of £4,500,000. The sum of £800,000, saved by accepting a British tender, will be devoted to building a 6,000 ton seaplane-carrier in Australia. The Australian Government has also ordered two submarines from Messrs. Vickers, Ltd., Barrow-in-Furness, at a cost of £716,000.

RETURN OF THE "ADELAIDE."—On 10th January the cruiser "Adelaide," under Captain G. L. Massey, R.N., left Portsmouth on the conclusion of her three months' stay in England, having returned with the Special Service Squadron at the end of September, 1924. On her way home to Australia, the "Adelaide" was present at the Singapore Conference in the first week of March.

NEW HYDROGRAPHIC SHIP.—H.M. Sloop "Silvio," after being out of commission since 1919, has been brought forward to be fitted out at Pembroke for duty as a surveying ship for the Australian Navy. Captain J. A. Edgell, O.B.E., R.N., late Superintendent of Charts at the Admiralty, was lent to the Australian Government from 1st April for duty in command of the "Silvio," and in charge of the surveying work to be carried out from her. H.M.S. "Silvio" will become H.M.A.S. "Moresby" on joining the Dominion Navy.

DESTROYERS AS TRAINING SHIPS.—In January, the destroyer "Swordsmen," one of the war-built vessels presented to the Royal Australian Navy in 1919, was allotted as training ship for the citizen Naval Reserves at Sydney. There are now six destroyers employed in such duty, the others being the "Huon," at Hobart; the "Swan," at Launceston; the "Torrens," at Adelaide; the "Warrego," at Brisbane; and the "Yarra," at Geelong.

SECOND NEW ZEALAND CRUISER.—The New Zealand Government, which a year ago offered £100,000 towards the cost of the Singapore base, decided after the postponement of that undertaking to devote the sum to the maintenance of a second cruiser of the same type as the "Dunedin." An Appropriation Bill authorising the Government to spend the money in this way was introduced in November, 1924. During its discussion, Mr. Massey, the Prime Minister said that New Zealand must do her share towards the defence of the Empire, since war would come whether she liked it or not. New Zealand's responsibilities now ranged

from Nauru Island to the Ross Sea, and the Imperial Government asked the Dominion to take control of Samoa.

H.M.S. "DIOMEDE" SELECTED.—Early in January it was announced that the second New Zealand cruiser would be the "Diomedé," serving on the China Station, which it had already been decided to replace by the "Vindictive" after the latter's reconditioning. The "Diomedé" will be relieved on 23rd July by the "Concord," at present attached to the Australian Fleet, the "Concord" serving in China until the arrival of the "Vindictive." Reaching England about 2nd September, the "Diomedé" will fit out for service in the New Zealand Division and will recommission on 1st October.

CANADIAN DESTROYER AT BERMUDA.—The destroyer "Patriot," of the Royal Canadian Navy, Lieutenant Howard Reid, R.C.N., in command, arrived at Bermuda on 15th January to be attached for another short period to the Imperial Squadron on the North America and West Indies Station. The vessel left on the 31st for Trinidad, to join the Eighth Cruiser Squadron under Vice-Admiral Sir James Fergusson, and afterwards accompanied them to Barbados and Antigua, returning to Bermuda on 28th February.

SOUTH AFRICAN TRAINING SHIP.—Shortly before his handing over the post of Commander-in-Chief on the Africa Station, Vice-Admiral Sir Rudolf Bentinck, K.C.M.G., C.B., inspected the South African training ship "General Botha," accompanied by his staff, and was able to present a favourable report to the Board of Control. "I trust," said the Admiral in conclusion, "that the good start which has now been made in the ship may be continued, and that it may have the effect of fostering in the people of South Africa generally a sense of the importance of sea-power, sea-borne commerce, and maritime traditions."

THE ROYAL INDIAN MARINE.—Rear-Admiral H. W. Richmond, C.B., Commander-in-Chief, East Indies, spent Christmas and the New Year in his flagship, the "Chatham," at Calcutta. At a dinner given to him and his officers at Government House, Calcutta, Lord Lytton, in proposing the toast of the Sea Services, welcomed the Admiral's presence in Calcutta, and hoped that he and his successor would make this visit an annual one. Admiral Richmond, said Lord Lytton, is anxious to restore the Royal Indian Marine to the position of a fighting force like its predecessor, the Indian Navy, and he concluded: "I wish him all success in carrying out the scheme which he has in view for the reorganisation of the Indian Marine."

FOREIGN NAVIES.

ARGENTINE.

TRIBUTE TO CORONEL DEAD.—On 28th November, 1924, when passing the site of the battle of Coronel, the commanding officer of the Argentine battleship "Moreno" paraded his crew and rendered homage to the British sailors who died for their country in those waters. His Majesty's Government has thanked the Argentine Government for this act of courtesy.

FRANCE.

CONSTRUCTION PROGRAMME.—In the official return of fleets (Cmd. 2349) issued on 28th February, the total number of vessels of all kinds building and projected for the British Empire, United States, Japan, France, Italy, Russia and Germany, on 1st February, 1925, was given as 352. Of this total, the largest

for one Power was 126, for France, which includes vessels to be put in hand up to 1929. The French return included 9 cruisers—the "Duguay-Trouin," "Lamotte Picquet," and "Primague," of 7,873 tons; the "Duquesne" and "Tourville," of 10,000 tons; and four more projected, but not yet authorised. One ex-battleship, the "Béarn," is being converted into an aircraft-carrier. Then come 21 flotilla leaders, six of the "Jaguar" type, begun in 1922-23, and 15 projected but not yet authorised; 36 destroyers, including 18 projected but not yet authorised; and 59 submarines, of which 23 are building—two of 1,363 tons, nine of 1,129 tons, and 12 of 590 tons. Two cruiser submarines, 28 first-class submarines, and six minelaying submarines, are projected but not yet authorised, to be laid down between 1925 and 1929.

DESTROYERS LAUNCHED.—In the last week of February, the flotilla leader "Lynx," of 2,359 tons, was launched by the A. et C. de la Loire, St. Nazaire; and the "Tempête," of 1,434 tons, was launched by Messrs. Dubigeon, Nantes. The former is one of the six "Jaguar" class, with 50,000 horse-power and 35½ knots speed, carrying five 5·1-in., two 2·9-in. A.A., and six torpedo tubes. The latter is one of the twelve vessels of the "Bourrasque" class, with 30,000 horse-power and 33 knots, armed with four 5·1-in., one 2·9-in., and six torpedo tubes.

BATTLESHIP WRECK REFLOATED.—In February, the wreck of the battleship "Liberté," which was destroyed in Toulon Roads in September, 1911, as the result of an explosion in her magazines, causing the loss of nearly 400 lives, was refloated and taken into dock to be broken up. The salvage feat was a difficult one, as the vessel had sunk deeply into the silt.

GERMANY.

NEW DESTROYER.—In addition to the cruiser "Emden," the launch of which was recorded last quarter, Germany is building for replacement purposes, as allowed by the Peace Treaty, a destroyer. The vessel will be of 773 tons, and will carry four 4·1-in. guns and four torpedo tubes.

ITALY.

FAST NEW CRUISERS.—The highest speed credited to any of the cruisers in the new issue of the official return of fleets is that of the Italian vessels "Trento" and "Trieste," of which class three more are projected but not yet authorised. These vessels will have the geared turbines of 150,000 horse-power—or a higher power than has yet been given to any battleship or other vessel of war. The "Hood," of 41,200 tons, has 144,000 horse-power to attain a speed of 31 knots. The "Trento," of 10,000 tons, is designed for 36 knots. The next highest speed given in the official return is the 34 knots of the French cruisers.

FLOTILLA LEADERS COMPLETED.—The flotilla leaders "Tigre" and "Pantera," laid down in 1921, were completed during the quarter under review. In company with the "Leone," completed in 1924, they are to make a cruise to British ports during the spring and summer, visiting Portsmouth from 28th April to 5th May, Bristol and Liverpool from 6th May to 14th, Glasgow from 15th to 22nd May, and Edinburgh from 24th May to 1st June. They are of 2,165 tons, 50,000 horse-power, 35 knots speed, and carry eight 4·7-in., two 3-in. A.A. guns, torpedo tubes, and sixty mines.

JAPAN.

VESSELS SCRAPPED.—On 9th February, the Japanese Embassy states, the disposal of the following 14 warships was completed, in accordance with the terms

of the Washington Treaty:—The "Aki," "Satsuma," "Hizen" and "Tosa" were sunk at sea. The "Ikoma," "Ibuki," "Kurama," "Kashima," "Katori" and "Amagi" were completely broken up, and the "Settsu" was retained for use as a target. The "Asahi" and the "Shikishima" have been rendered unfit for fighting service. The "Mikasa," which was Admiral Togo's flagship at the Battle of the Tsushima Strait during the Russo-Japanese War, and was also to have been scrapped, has been rendered unfit for fighting service. It is to be preserved as a national relic, after due arrangement with the other Powers concerned in the Treaty.

CRUISERS AT SAN FRANCISCO.—During the last week of January, the Japanese Midshipmen's Practice Squadron, under Vice-Admiral Sauro Hyakutake, visited San Francisco, and received a cordial welcome from the United States naval, military and civic authorities. The Squadron was composed of the cruisers "Asama," "Yakumo," and "Idzumo," all of which saw service under Admiral Togo in the Russo-Japanese War, and formed part of the Tsingtau blockading squadron during the World War. There were about 320 midshipmen on board. To greet the Japanese, Admiral S. S. Robison, Commander-in-Chief of the U.S. Battle Fleet, sent Vice-Admiral H. A. Wiley, with the battleships "West Virginia," "Colorado" and "Maryland," from the base at San Diego. The "Tennessee" was already at San Francisco, and the "Oklahoma" arrived a few days later.

VISIT TO VANCOUVER.—By special invitation, the Japanese Squadron afterwards proceeded to Vancouver, and its officers were entertained to a banquet at Victoria by the Federal Government, the midshipmen being entertained at a separate banquet. All the 17,000 Japanese in British Columbia, said the correspondent of *The Times*, seem to have crowded into Vancouver to greet the Squadron. Early on the morning of 8th February a mishap occurred to a leave boat containing 150 men returning to the flagship "Asama," which came into collision with other boats and capsized, 17 men being drowned. The night was very dark and the weather dirty, and rescue work was carried on with the aid of searchlights.

UNITED STATES.

NAVAL OMNIBUS BILL.—A new "Naval Omnibus Bill," which became law on 3rd March, sanctions various miscellaneous provisions. Section 7 is of importance to the Marine Corps, introducing a modified form of selection and providing for the retirement of certain war officers at fair rates of pay. Section 21 establishes a Naval Reserve Officers' Training Corps of not more than 1,200. Section 26 provides for issuing national flags free of cost to the mother or nearest relative of any officer or enlisted man whose death occurred between 6th April, 1917, and 3rd March, 1921. For the preservation of the frigate "Constitution," 473,225 dollars are voted. Section 28 provides for the retirement of staff officers who held the rank of rear-admiral in the war, with three-fourths of the pay received by them on the active list at the date of retirement; while Section 29 provides that officers commended for service in action during the war, when retired for age, etc., shall be given the rank of the next higher grade and with the pay which they would have received if they had not advanced in rank pursuant to this section.

NAVAL APPROPRIATION BILL.—The Naval Appropriation Bill passed the House of Representatives in the first week of February, carrying a total expenditure of 293,085,478 dollars, including indefinite appropriations. Proposals have been put forward by the Senate aimed at calling together another Naval Conference.

STRATEGIC EXERCISES.—On 1st March, the Battle Fleet, under Admiral S. S. Robison, left the San Diego-San Pedro area to participate in strategical manoeuvres with the cruiser divisions of the Scouting Fleet from the Atlantic seaboard, under Rear-Admiral T. P. Magruder. These operations have been described as the largest in the history of the American Navy, 110 vessels being engaged. A "Black" fleet was ordered to convoy a supply force to a point on the California coast for the establishment of a base, and to a "Blue" fleet of fast vessels coming from the Atlantic was entrusted the task of defending the coast. These manoeuvres were to continue until April, when a cruise to the Hawaiian Islands and to Australia, as already announced in the JOURNAL, was to begin.

SPECIAL BOARD REPORT.—President Coolidge in February made public a report of the Special Board convened at his direction to investigate the needs of the Navy, with particular reference to progress in submarines and aircraft. The Board's conclusion was to the effect that the battleship remains the final arbiter in sea warfare, and aeroplanes can never assume paramount importance. The creation of a separate air force is held to be "illogical and undesirable."

THE "WASHINGTON" TESTS.—The Special Board made a detailed investigation of the bombing tests with the "Washington," the sinking of which was recorded in the last JOURNAL. They found that the ship withstood five tests, three by 2,000-lb. underwater bombs, and two by 400-lb. torpedo charges, with explosives detonated in contact with the underwater hull, but she still remained afloat for four days afterwards and outrode a storm. "The results of the tests," it was found, "demonstrate that the hull of the latest type of battleship is capable of withstanding to a remarkable degree the attacks of aerial bombs, and that with a crew on board to make necessary repairs, run the pumps and man the anti-aircraft guns, such a ship as the 'Washington' would be substantially secure against air attack."

AIR ATTACKS ON BATTLESHIPS.—In reply to questions put by members of the House Committee on Naval Affairs, the Secretary of the Navy, Mr. Wilburn, stated on the 8th January last, that "a battleship has not yet been sunk by a bomb dropped from an airplane on its deck."

ARMY NOTES

ARMY NOTES.

HOME.

THE LATE FIELD MARSHAL LORD GRENFELL.

The death took place, on 27th January, of the veteran Field Marshal of the British Army, the Rt. Hon. Lord Grenfell, G.C.B., G.C.M.G., Colonel Commandant K.R.R.C. The late Field Marshal will best be remembered as having been Sirdar of the Egyptian Army prior to Lord Kitchener. The resuscitation of the Egyptian Army was mainly his work during those strenuous years, and the brilliant action of Toski, which was fought under his leadership, showed him to be a leader of no small merit.

The Editor regrets that this sad event should not have been chronicled in the February number of the JOURNAL owing to the date of going to press.

THE LATE GENERAL LORD RAWLINSON, COMMANDER-IN-CHIEF OF THE ARMY IN INDIA.

The death took place, in India, on 28th March, of General Lord Rawlinson, G.C.B., G.C.S.I., G.C.V.O., K.C.M.G., at the age of 61, following on an operation.

The Army thus loses a brilliant leader who was still of an age at which he might have rendered valuable service to the country for many years to come. Lord Rawlinson's record is familiar, and was summarised in *The Times* for 29th March.

Lord Rawlinson's period of office as Commander-in-Chief was due to terminate next November. His successor, Field Marshal Sir William Birdwood, Bt., G.C.B., G.C.M.G., K.C.S.I., C.I.E., D.S.O., was designated only a few days before Lord Rawlinson died.

COMMANDER-IN-CHIEF IN INDIA.

The following extract is taken from the *London Gazette* for 10th April :— "General Sir Claud William Jacob, K.C.B., K.C.S.I., K.C.M.G., to be Commander-in-Chief in India, *vice* the late General H. S. Rawlinson, G.C.B., G.C.S.I., G.C.V.O., K.C.M.G., with effect from 30th April, 1925, until His Majesty's further pleasure has been signified."

It is understood that Sir William Jacob will thus act as Commander-in-Chief until Sir William Birdwood's return to India early this summer.

PRINCIPAL APPOINTMENTS DURING THE PAST QUARTER.

G.O.C. the Forces in China.—Major-General C. C. Luard, C.B., C.M.G., *Director of Remounts (War Office).*—Major-General G. H. A. White, C.B., C.M.G., D.S.O. *Director of Personal Services.*—Major-General G. J. Farmer, C.B., C.M.G., *G.O.C. 55th (West Lancashire) Division, Territorial Army.*—Major-General H. D. De Prée, C.B., C.M.G., D.S.O.

ARMY ESTIMATES.

The net total of the Estimates for the Army for the year 1925-6 is £44,500,000. The reduction of £500,000 from those of the current year is due chiefly to the terminal charges being lower. The following table shows the progressive diminution of the Estimates during the past four years :—

1922-3	...	...	...	...	...	...	£62,300,000
1923-4	...	...	...	...	...	...	£52,000,000
1924-5	...	...	...	...	...	...	£45,000,000
1925-6	...	...	...	...	...	...	£44,500,000

RECRUITING.—The financial year will probably begin with a shortage of 2,000 to 3,000 in the strength of the British Army, exclusive of the British troops in India, which will be approximately up to establishment. This is an improvement on the current year, but the position is not altogether satisfactory in view of the large number of men due to leave the Colours during the coming year. Recruiting during the last twelve months has been disappointing, as although 34,000 men were required during that period in order to replace the normal annual loss and to permit some 7,500 men with the Colours to transfer prematurely to the Army Reserve, a total of only some 30,000 recruits is now anticipated, with a consequential diminution of these transfers.

Of the applicants who have been served with notice papers during recent years from 55 to 60 per cent., or rather more than half, have been rejected on account of medical and physical defects, while a further 5 per cent. have been rejected as unsuitable because they were unable to furnish satisfactory references as to character or did not conform in other respects to the required standards.

ARMY RESERVE.—As a result of the premature transfer of 6,000 men to Section B, and of the re-engagement of men about to leave Section D, the strength of Sections B and D of the Army Reserve will have risen during the year by 8,000 to 94,000 on 1st April, 1925, and owing to the operation of similar measures should increase in the ensuing year by a further 5,000. In order to provide for the immediate preparation of the Army to meet minor emergencies overseas without the dislocation caused by a general calling up of the Reserve, Section A of the Army Reserve will be re-opened to admit 3,000 men prepared to undertake the extra liability in return for additional Reserve Pay of 6d. a day.

TERRITORIAL ARMY.—The strength of the Territorial Army on 1st February, 1925, was 6,121 officers and 133,481 other ranks, as compared with 5,965 officers and 134,130 other ranks on 1st February, 1924. The present strength represents 78 per cent. of the authorised establishment in the case of officers and 76 per cent. in the case of other ranks.

OFFICERS' TRAINING CORPS.—The Junior Division of the Officers' Training Corps is in a flourishing condition; its establishment is full and many applications from the schools for admission have had to be refused on financial grounds.

SUPPLY OF OFFICERS.—The new regulations under which commissions in the Regular Army may be obtained by University candidates have evoked a good response. Regulations have been issued whereby 11 scholarships of the value of £50 a year, tenable for five years after joining their regiments, will be open next year to candidates from the Cadet Colleges and the Universities.

TANKS AND MECHANICAL TRACTION.—Considerable progress has been made during 1924-5 in the experimental work necessary before a definite policy regarding the mechanicalisation of the transport of the fighting units of the Army can be decided, and the coming year will be devoted to further experimentation.

HEALTH OF THE ARMY.—The health of the Army throughout the year has continued to be very satisfactory, except for some influenza of a very mild type during the early months of the year.

MISCELLANEOUS.

ARMY RESERVE.—On the re-introduction of Section A of the Army Reserve, it will be composed of reservists of selected branches of the Service, and enrolment

will be restricted to men whose character on transfer to the Reserve was not lower than "Good," who are medically fit for service at home and abroad and who engage at the time of their first transfer to the Reserve to join the section, or are permitted to join it from Section B within the first twelve months of their transfer to the Reserve. Married men may be accepted.

Men on joining Section A will be required to serve in it for a year; but if medically fit for service at home and abroad, may be allowed to re-engage for not more than two years from the date of transfer to the reserve. During the term of their engagement they will be liable to be called up for service with the Colours, irrespective of whether reservists of Sections B and D are called out or not, and without the necessity of previous proclamation or communication to Parliament. They will not be liable as members of this Section to be called out for service with the colours unless they are required to serve outside Great Britain and Northern Ireland, when warlike operations are in preparation or in progress. When so called out for service they will not be liable to serve for more than 12 months with Colours. They will, however, at all times be liable to be called out on permanent service by Proclamation under Section 12 of the Reserve Forces Act, 1882. The rate of pay will be 1s. 6d. a day, payable quarterly in arrear, and will be in lieu of the ordinary Army Reserve pay.

ARMY RESERVE TRAINING.—Reservists of the Cavalry, Foot Guards, and Infantry of the Line will be required to undergo a modified form of training and drill during this year.

ARMY MANŒUVRES.—Army manœuvres will be carried out in September next in Hampshire and Wiltshire, and in parts of Berkshire, Surrey, Sussex and Dorset. The troops engaged will comprise 4 Regular Infantry Divisions, 1 Territorial Infantry Brigade, 1 Cavalry Division, a force of Tanks and Dragons, and a number of squadrons of the Royal Air Force. The troops will be concentrated in the Manœuvre area about the end of August and beginning of September and will be engaged in training for a time prior to the actual Army Manœuvres which will take place at the end of September.

As this is the first time since the war that it has been possible to hold Manœuvres, and as it is unlikely that funds will permit of their being held annually on a similar scale, it is specially desirable that the forthcoming Manœuvres should be as free from limitations as possible. It is hoped, therefore, that the cordial co-operation of landowners and farmers, which always facilitated Manœuvres before the War, will admit of restrictions being very limited.

COMMISSIONS IN THE ARMY.—Not fewer than 63 cadetships at the Royal Military Academy, Woolwich, and not fewer than 200 cadetships at the Royal Military College, Sandhurst, will be open for competition at an Army Entrance Examination beginning on 23rd June next. In addition, 6 cadetships at the Royal Military Academy and 18 at the Royal Military College will be open to Headmasters' nominations and 15 cadetships at Sandhurst to nominations from the ranks. Eligible candidates must not have attained the age of 19 years on 1st July, 1925, but must have attained the age of 18 years on that date.

Of the cadets entering the Royal Military Academy, Woolwich, in September, 1925, 30 will be commissioned in the Royal Artillery, not fewer than 9 in the Royal Engineers, and not more than 30 in the Royal Corps of Signals. Those entering the Royal Military College, Sandhurst, will be commissioned in the Cavalry, Foot Guards, Infantry, Royal Tank Corps, and Royal Army Service Corps of the British Services and in the Indian Army.

PERMANENT COMMISSIONS IN REGULAR ARMY, TERRITORIAL ARMY AND SUPPLEMENTARY RESERVE OFFICERS.—In the case of an officer of the Territorial Army or an officer of the Supplementary Reserve, who has previously served with credit in any branch of the Naval, Military, or Air Forces of the Crown, and who is a candidate for a permanent Regular Army Commission, the period of two years' commissioned service in the T.A. or Supplementary Reserve, as the case may be, which under existing regulations must have been served before the officer is eligible to attend the qualifying examination, may be reduced at the discretion of the Army Council, provided the remaining conditions are satisfied.

RETIRED OFFICERS AS ARMY RECRUITERS.—A waiting list is now kept at the War Office of retired officers who are desirous of and recommended for the appointment of Retired Recruiting Officer. To be eligible for registration, candidates must be under 56 years of age, on retired pay, and have obtained a regular commission direct from the ranks. A vacancy in a county recruiting zone will normally be filled by the appointment of a retired officer of the County regiment, and in a city recruiting zone, by the appointment of a retired officer of a corps having no county connections.

FORCED LANDINGS BY AIRCRAFT.—Circumstances may arise which compel the pilot of an aeroplane to make a forced landing in a field in which troops are parading or carrying out manoeuvres. If there is not time for the troops to double to the sides of the field, they should not be allowed to scatter in an endeavour to dodge the aeroplane, but should lie down immediately; for if the men are allowed to run about, it not only confuses the pilot and increases the chance of a crash but renders the men liable to be hit by the aeroplane. In the case of a forced landing, where the aeroplane is undamaged, the officer commanding the nearest army unit should, if called upon, provide a guard for the aeroplane until the arrival of an R.A.F. guard or salvage party (or, in the case of civil aircraft, the local police), to take over the aeroplane. If the crash takes place near a military barracks, camp or detachment, the troops witnessing it will, on their own initiative, render all assistance possible in removing the pilot and passengers from the wreckage; but in order that subsequent investigations may be made to determine the cause of the crash, the wreckage should be disturbed as little as possible in so doing.

UNIVERSITY COURSES FOR ARMY OFFICERS.—Officers desirous of being seconded in order to commence a University Course, will be required to read for an honours degree, and must be prepared to give a guarantee that they will continue to serve for at least three years after completing the course.

ARMY DRESS.—The white cap cover is abolished for wear at home stations, except as specially provided for use on manoeuvres. It will be worn when the forage cap is worn at stations abroad in the "White Mess Order" of Dress.

REGIMENTAL ALLIANCES.—The King has approved of the following regimental alliances:—

The 17th Duke of York's Royal Canadian Hussars to the 13th/18th Hussars.
Princess Patricia's Canadian Light Infantry, to the Rifle Brigade (Prince Consort's Own).

The Saskatoon Light Infantry, Canadian Militia, to the King's Own Yorkshire Light Infantry.

The following alliances of New Zealand Force units have also been approved:—
The Wellington Coast Regiment to the Hampshire Regiment.

The Nelson, Marlborough, and West Coast Regiment to the Durham Light Infantry;

The New Zealand Veterinary Corps to the Royal Army Veterinary Corps.

TERRITORIAL ARMY.—During the past four months 6,555 recruits have been finally approved for service in the Territorial Army. Of these 1,898 were enlisted in January. But 1,683 officers and 42,669 other ranks are still required to complete the peace establishment. The present strength of 139,602 officers and men, exclusive of the permanent staff, is distributed as follows:—

Western Command	39,188
Northern	39,177
Scottish	21,985
Southern	20,806
Eastern	19,439
London District	17,097
Total	139,602

The Divisions whose total strength now exceeds 8,000 are the following:—Highland, 9,214; Northumbrian, 8,919; Welsh, 8,907; West Lancashire, 8,729; West Riding, 8,569; East Lancashire, 8,515; North Midland, 8,505.

TERRITORIAL ARMY COLOURS.—It has been decided that amalgamated battalions of the Territorial Army may continue to hold both sets of Colours in their possession and to carry them alternately on parade. On no occasion, however, will both sets of Colours be carried at the same time.

THE TERRITORIAL RECRUIT'S BOUNTY.—A recruit who does not attend annual training in camp as a recruit, although he may have completed his preliminary drills by 31st October next following the date of his enlistment, will not be eligible to earn the recruit's bounty of £2. He will, however, be eligible to earn the trained man's bounty of £2 10s. in his second training year, provided that he has completed his recruit's course of musketry (or its prescribed alternative) within 12 months of his enlistment.

A recruit who attends annual training in camp before completing his preliminary drills, will be eligible to receive the recruit's bounty if he completes these drills within 12 months of enlisting. A recruit who can neither attend annual training in camp nor complete his preliminary drills before 31st October next following his enlistment, will also be eligible for the bounty if, with the permission of his C.O., he carries out the preliminary drills for a recruit within 12 months of enlistment and attends camp in his second training year.

A boy recruit will be eligible to earn a man's bounty (£2) during the training year in which he reaches the age of 17. Drills performed before he reached that age, if they were carried out within that training year, will be allowed to count towards the prescribed number required in the case of a recruit under the Regulations.

OFFICERS' TRAINING CORPS.—The results of the recent examination for Certificates "A" and "B" Officers' Training Corps were announced yesterday.

For Certificate "A" (Infantry) primarily intended as a qualification for a commission in the Territorial Army and Regular Army Reserve of Officers, now or in the event of a national emergency, 3,071 candidates were examined and 1,797 were successful. Fifty-nine of these candidates (of whom 36 were successful) were from 16 schools unconnected with the Officers' Training Corps.

For Certificate "B," a more advanced certificate, open to the Senior Division only, there were 296 candidates, and of these 129 were successful.

The Report on the last Examination for Certificates "A" and "B" for Cadets of the Officers' Training Corps points out that the percentage of failures in the papers on Tactics (Part II.) has again increased, although the papers, in the case of Certificate "A" (Infantry), were, if anything, easier than in the previous examination. This, in the view of the examiners, would appear to indicate that an insufficient proportion of the time available for instruction is devoted to the study of tactics, but the great tendency to "cram" for the examination may also be partly responsible for the results. This latter criticism is directed also to the work submitted under Part I. of the Examination. As regards Certificate "A" (Infantry), the examiners think that there is still considerable room for improvement under the headings "field signals," "extended order," and "battle drill." In "weapon training" they lay stress on the desirability of paying more attention to improving the instructional ability of candidates. The general knowledge shown in Map Reading is, however, now good. These points, brought out in connection with the work of infantry candidates apply in varying degrees in the case of engineer candidates; while in regard to artillery and cavalry candidates, the chief criticism is directed to horsemanship. The standard of efficiency, however, shown by the medical candidates was "distinctly high."

In the more advanced certificate "B," drill and tactics of cavalry candidates were fair but horsemanship was poor. Artillery candidates had vague ideas on the subject of artillery support to other arms, the technical knowledge of engineer candidates was generally satisfactory, but drill and tactics were not so good. Many of the criticisms made in connection with the Certificate "A" examination of infantry candidates also applied to Certificate "B" candidates, who sometimes revealed very confused ideas in tactics; but the general standard of efficiency attained by cadets who presented themselves for the Medical Examination was "of a high order."

VOLUNTARY AID DETACHMENTS.—It is announced that the King has graciously permitted the Royal Crown to be included in the Badge for Mobile members of the Voluntary Aid Detachments.

Already over 200 Men's and Women's Detachments have been formed and received official recognition. These detachments have been raised by the St. John Ambulance Association, the British Red Cross Society and the St. Andrew's Ambulance Association. County Controllers have been appointed in nearly every County in England, Scotland and Wales, and a Scottish and a Welsh Committee have been formed with Headquarters in Glasgow and Cardiff respectively. These Committees are responsible to the Central Joint Voluntary Aid Detachment Council for the administration of the New Scheme in those areas.

The Scheme was evolved in 1923 out of our experience in the Great War, and in that year it was decided to reconstitute the Central Joint Voluntary Aid Detachment Committee formed during the war to administer Voluntary Aid Detachments. As it now exists, the scheme is designed to supplement the Medical Services of the Naval, Military and Air Forces on emergency in any part of the world, and the various Territorial Army Associations are responsible for the enrolment and organisation of V.A.D. members.

Members are now being trained for eight days in Naval, Military and Air Force Hospitals, and "Training Regulations" have been issued and classes of instruction are being held in most centres and districts.

FOREIGN.

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FRANCE.

UMPIRING.

GENERAL NOTES.—Two factors have led to radical modifications in post war methods of manœuvre and fighting and have necessitated a corresponding revision in the system of umpiring. These are :—

- (a) The "overwhelming" fire power of modern weapons for which the French in particular have a great respect.
- (b) The introduction of new arms and services or the development of existing ones, such as Air Force, Tanks, Communications and Mechanical Transport.

These two factors have made the value of manœuvres more than ever dependent upon a sound system of umpiring, such as will ensure that operations develop with a due regard for realities and within the sphere of probabilities.

It was on this basis that the French General Staff drew up their post war provisional instructions for umpiring, and these were tried out first at the Coëtquidan manœuvres in 1922, as a result of which they were redrafted and again tested in the Nancy manœuvres of this year, particularly in regard to the umpiring of air operations.

The text of these instructions is that "fire is the dominant factor on the battlefield" and great stress is laid on the necessity of bringing this home to all taking part in tactical exercises in order to avoid unrealities and false conclusions : this applies as much to one's own fire as to that of the enemy.

It is further taken for granted that units and formations up to and including the division will always fight *encadré* ; that is to say, with other units and formations on their flanks.

As regards fire effect, the difficulty of representing it during training is much greater than it was before the war owing to increase in material, range and mobility ; in the case of small units, such as battalions and companies, it can be done mainly by means of flags, rockets, smoke grenades and light signals, though it is hoped to improve these mechanical methods as a result of experiment and experience. The principal objection to them, and one which it is very difficult to overcome, is that they indicate too obviously the source of fire and thus ignore one of the great problems of the real battlefield.

But these methods are not practical for the training of larger units, since they tend to cramp manœuvre, are too rigid and require too large an expenditure in *personnel* and *matériel* ; the only resort in this case is to umpiring. To enable the umpires to represent fire effect to the troops, the former are provided with maps showing the hostile gun positions and the ground covered by hostile artillery and machine gun fire. On these maps are also shown any special difficulties likely to be met with in the advance due to hostile fire and, as far as ground and cover are concerned, the best method for avoiding them.

In addition, all umpires are kept constantly informed of the situation on both sides by means of a very carefully organised system of communications (see Section III. and Appendix I.), which also enables the chief umpire to issue rapidly his orders and instructions based on the changing conditions of the operations. He can thus control the situation and bring out the required lessons.

By these means the umpires know the fire plan of both forces and can give decisions accordingly.

The increased range of artillery and the employment of aeroplanes have resulted in a great extension of fire effect behind the front line, and for this reason it is now necessary to extend the umpiring organisation to a corresponding depth to include rearward services.

The general instructions sum up the aim of umpiring as follows:—

- (a) As regards the troops and services, to paint the picture of fire effect and make deductions from it; to emphasise the importance of *liaison* between the various arms and to assist in the training of the troops.
- (b) As regards the director of the operations, to keep him *au fait* with developments and to ensure that these latter are logical and in conformity with the instruction which it is sought to give.

These aims can be realised only by a sound system of umpiring, in which all ranks have confidence, and which does not discourage initiative and energy by too frequent and unnecessary interference.

For the training of small units, battalions and companies, the duties of director and umpire are usually combined, officers of other arms being attached as necessary to answer for fire effect; but in the training of larger units and formations umpiring forms a separate organisation, though the chief umpire works under the orders of the director of the exercise.

ii) *Umpiring personnel.*

Umpiring *personnel* consists of:—

- (a) Senior officers, who are also responsible for assisting the director in the instruction of the troops; in the case of important exercises, these officers are distributed in groups, a definite task being allotted to each group. Examples of these tasks are:—To control operations in a particular area, as, for instance, the zone of infantry fire; to follow the work of one or more units in depth, the usual method in the case of reserve formations; to work with a particular arm or service, *i.e.*, aircraft, tanks, signal units.
- (b) *Personnel for liaison* work and consisting of regimental officers or even non-commissioned officers, whose duty it is to keep the umpires informed of the situation in the unit with which they are working.
- (c) Officers of the directing staff who assist the chief umpire by studying the orders issued by commanders and the information made available, keeping the situation of the troops up-to-date and preparing his decisions and reports.

(iii) *Communications for use of Umpires.*

In all large scale exercises a special system of communications is provided for the use of the umpires, consisting of telephone, telegraph, wireless or visual, despatch riders and pigeons; wireless is, however, sparingly used, as it is apt to jam that of the troops; a balloon is also sometimes allotted for the use of umpires as an observation post for the collection of information and also as a means of sending signals. A diagram to illustrate the system of communication and the lay-out of umpires for a divisional exercise is given in Appendix I, each part being connected by telephone, supplemented by other means of communication, so that all umpires are in touch with each other and with the chief umpire.

(iv) *Method of Umpiring.*

The work of an umpire is divided into three successive stages:—

- (a) To provide information, usually in the form of an intelligence summary, particularly as regards fire effect, which would be known to the troops

automatically in war, so that they may be able to appreciate the situation correctly.

(b) Having provided this information, to note how the troops set about the attainment of their objective.

● (c) To point out to the troops the lessons to be learnt from the action taken and the probable results which would have been obtained in war.

In principle, intelligence summaries and all important decisions of the umpires are given in writing.

The method of umpiring varies according to the rôle allotted and is dealt with under the following headings:—

- (1) With troops or administrative services in the zone of infantry fire.
- (2) With troops or administrative services behind this zone.
- (3) On the chain of command for the purpose of noting the effect of orders issued or of unexpected situations arising.
- (4) Air umpiring (*arbitrage aérien*).
- (5) On the system of communication.

(1) In the zone of infantry fire.

It is laid down that only such information should be given to the troops as they would be likely to possess in reality and that care should be taken to avoid providing them with data which they ought to be able to obtain for themselves; thus an umpire with an artillery unit would not supply information as to the position of the infantry which it is covering.

At Appendix II. is given a list of points on which the umpire may be required to provide information.

Umpires are instructed to avoid interfering personally during the progress of an operation, but to confine themselves to observation from a favourable point and to the collection of information from their *liaison personnel*. When the operation is finished or when it is necessary to stop it, the umpire does so by issuing a decision, which in the case of an attack generally involves holding up the advance.

It is not usual to make actual casualties; this has been given up owing to the confusion it caused; but commanders are informed by the umpires of the percentage of loss suffered by their units, *i.e.*, the reduction in their fighting value; it is then up to the commander concerned to use his judgment as regards further action, the employment of reserves, &c., and on this action the umpires base their decisions. This system has the advantage not only of avoiding confusion, but also of developing judgment and decision.

Large units are not ordered to retire, owing to the fatigue and waste of effort involved.

(2) In rear of the zone of infantry fire.

The rôle of the umpire in this case is comparatively simple and consists mainly in noting whether dispositions are taken in accordance with the development of operations and, where necessary, in anticipation of orders, and whether *liaison* is good with other units and formations.

Umpires in this zone are few but require quick means of transport; they are usually accompanied by representatives of the various administrative services (supply, medical, &c.). A list of points on which an umpire may be required to give information to troops in this zone is also contained in Appendix II.

Types of penalties inflicted by umpires in this area are: ordering a battery to cease fire, holding up the advance of a unit which has ignored the effects of hostile

artillery fire, or delaying the ammunition supply to the guns. The means by which the umpires represent fire effect have been dealt with in Section I.

(3) On the chain of command.

Umpiring here is mainly directed towards testing command and staff work and the *liaison* between the various arms; the method adopted is to follow and time an order from its origin to its execution or to watch the re-action of an unexpected situation through the various *échelons* of command; this work is usually done by the chief umpire or by specially selected senior officers, since it requires considerable tact and a thorough knowledge of staff work. Criticisms are given verbally and on the spot, whilst important cases are referred to the director.

(4) Air umpiring.

This is so important in modern peace training and involves so many special considerations that it will be dealt with in detail in a subsequent article in the November number of the Monthly Intelligence Summary.

It is governed by three factors:—

The speed of the aeroplane.

The altitude of the aeroplane.

The difficulty of communicating rapidly by existing methods with an aeroplane in flight.

Scouting and bombing machines are umpired from the air. Artillery and reconnaissance machines are normally umpired from the ground.

This ground umpiring is worked through the following organisation:—

A chief air umpire assisted by ground observers suitably distributed.

Anti-aircraft defence units.

Liaison personnel at the landing grounds.

Officers working under the chief air umpire for the purpose of communicating his decisions to the aeroplanes in flight by means of ground strips.

The chief air umpire is the only person who issues decisions.

Types of decisions are: an artillery aeroplane attacked by three hostile scouts and destroyed; an aeroplane photographing at too low an altitude and the photographs not allowed to be utilised.

Decisions are communicated either by ground strips to an aeroplane in flight or by telephone after it has landed.

(5) On the system of communication.

The three main points for umpiring here are:—

(a) Organisation.

(b) Tactical employment.

(c) Technical working.

The chief umpire examines and criticises organisation.

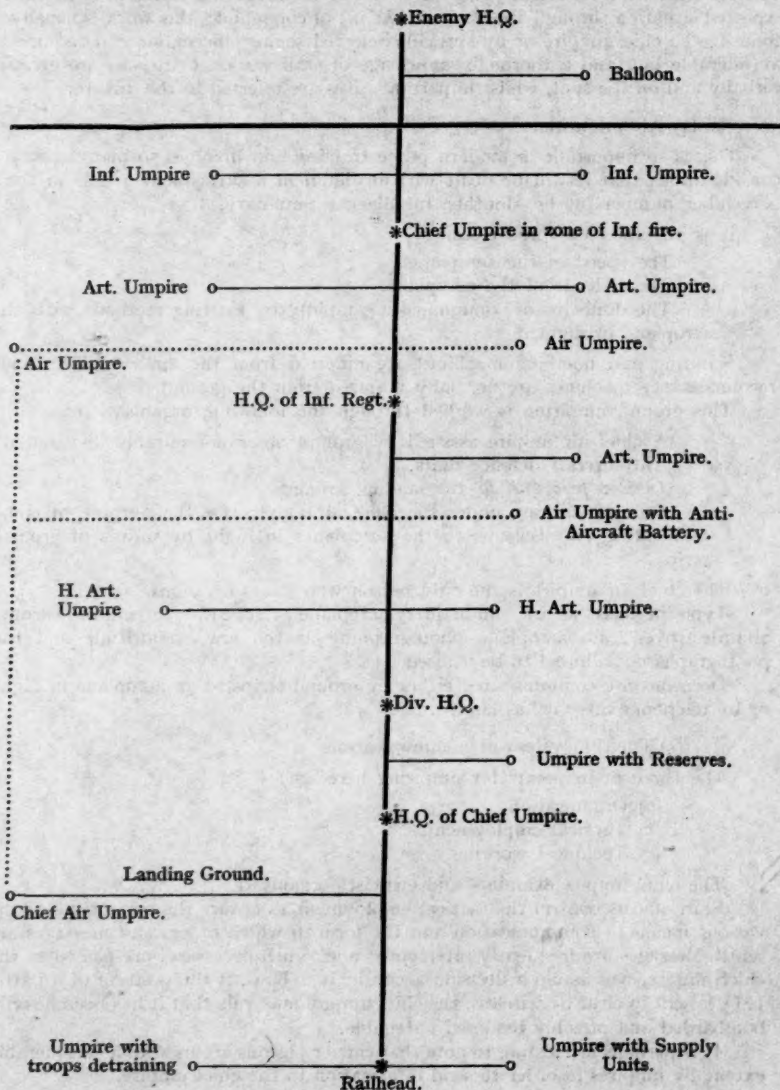
Staff officers control the tactical employment to ensure the correct use of the various means of communication and the form in which orders and messages are sent. Messages are frequently intercepted and, when necessary, are passed to the chief umpire, who issues a decision accordingly. Thus, if the position of a battle H.Q. is sent in clear by wireless, the chief umpire may rule that it has been heavily bombarded and possibly rendered untenable.

It is perhaps interesting to note that carrier pigeons are used to a considerable extent by umpires in order to send information to the chief umpire.

APPENDIX I.

SYSTEM OF UMPIRING FOR A DIVISIONAL EXERCISE, ALL UMPIRES
BEING IN COMMUNICATION AS SHOWN.

(Note.—Assistant personnel and personnel for communications are not shown.)



APPENDIX II.

I.—UMPIRING OF THE ZONE OF INFANTRY FIRE.

A.—NATURE OF INFORMATION TO BE GIVEN TO THE TROOPS.

To the Infantry.

Nature and importance of the covering artillery fire which the infantry would be able to see.

Nature and importance of hostile artillery fire to which the infantry would be exposed.

Nature of the hostile infantry resistance, particularly the fire of automatic weapons which the advance would come up against.

Action of hostile aircraft to which the infantry would be exposed.

To the Artillery.

Nature and importance of the enemy counter-battery fire.

Nature and importance of hostile artillery fire directed against their own infantry which they could see from their observations posts.

Movements of enemy infantry which they could see (for instance, counter-attacks, visible from artillery observation posts).

The action of enemy aircraft against the batteries.

B.—POINTS TO BE NOTED BY THE UMPIRE IN THE ATTACK.

Value of the artillery preparation for the attack.

The measures taken by infantry to reduce enemy resistance.

Precautions taken to conceal movements from aerial observation.

Co-ordination of effort between the different arms at the commencement of and during the attack.

Achievement of surprise.

Rapid consolidation of ground captured.

Measures taken to deal with counter-attacks.

In the Defence.

Organisation of the defensive system of fire.

Accuracy obtained in the opening of fire, especially artillery barrages.

Adequacy of observation in the defence.

Care with which a defensive position is camouflaged to escape aerial observation.

The distribution of the troops.

Role and employment of reserves.

Timing, direction and conduct of counter-attacks.

II.—UMPIRING IN REAR OF THE ZONE OF INFANTRY FIRE.

A.—NATURE OF INFORMATION TO BE PROVIDED BY THE UMPIRE IN THIS ZONE.

This information is concerned more particularly with the effect of hostile fire.

For Heavy Artillery Units.

Hostile counter-battery fire.

Enemy artillery fire against objectives visible from the heavy artillery observation posts.

Hostile aircraft action against the batteries.

In cases where there is only a skeleton or a flagged enemy, enemy battery positions which would be detected by the heavy artillery, either from observation posts (artillery ground observation posts or sound ranging posts) or from aerial observation.

For the Reserves either Halted or in Movement.

Zones beaten by hostile artillery fire.

Zones seen by enemy kite balloons.

Hostile artillery fire directed against the reserves.

The action of hostile aircraft directed against the Reserves

For the Supply and Administrative Services.

Information similar to that given in II. above.

B.—POINTS TO BE NOTED BY THE UMPIRE.

The points to which the umpires in this zone should direct their attention are as follows :—

Heavy Artillery.

- Choice of battery positions.
- Care with which these are concealed from aerial observation (aircraft and kite balloons).
- The speed with which orders are executed.
- Camouflage.
- Accuracy of calculations.
- The adequacy of the information which the heavy artillery possesses as to the general situation, and particularly the *liaison* between the heavy artillery and neighbouring infantry and field artillery units.

The Reserves.

The care with which movements are carried out and halting places selected so as to escape the observation of hostile aircraft.

The care with which routes and halting places are selected with reference to hostile artillery fire.

Steps taken by the reserves to keep in touch with the troops in front and with the situation generally.

Reconnaissance and the dispositions taken in anticipation of orders based on this reconnaissance and the knowledge of the general situation.

Supply and Administrative Services.

- Measures taken to avoid hostile fire (artillery and aircraft).
- The working of the supply and administrative services.

APPENDIX III.**NOTES ON THE SPECIAL INSTRUCTIONS ISSUED BY THE CHIEF UMPIRE FOR THE 20TH ARMY CORPS EXERCISES IN 1924.**

1. Working directly under chief umpire were the following :—
 - (a) A staff comprising one chief of staff and three bureaux :—
 - 1st bureau.—Organisation of umpiring *matériel*.
 - 2nd " —Collection and transmission of information.
 - 3rd " —Umpiring and the preparation of umpiring orders and instructions.
 - (b) Attached to this staff were the following :—
 - A colonel as chief artillery umpire, with the necessary assistants.
 - A colonel as chief umpire of communications, with the necessary assistants.
 - An officer to umpire the motor transport service.
 - An officer to represent the aerial and anti-aircraft defence umpiring at the headquarters of the chief umpire.
 - Liaison personnel* for attachment to formations.
 - (c) A certain number of umpire groups each under a colonel and allotted definite tasks, such as the zone of infantry fire, the chain of command, &c.
 - (d) Reserve *personnel* at the headquarters of the chief umpire to provide reliefs, undertake special missions or reinforce the umpires at certain points, as necessary.
 - (e) Each colonel acting as chief umpire as in (b) above, or in charge of a group as in (c), had a field officer as his assistant who belonged to a different arm of the service.
2. The following were the more important of the rules issued for the guidance of umpires in making decisions :—

The object to be arrived at is to provide those requiring it with such information as they would be able to get in war and in the same form as in war; the same information may be sent in different forms according to the recipient.

Do not allow a unit to advance without making proper use of its resources or without knowing how it is being supported.

Do not halt a unit for a fixed period, but only for so long as is required for it to take the measures necessary to justify a further advance.

Do not interfere to alter a situation, but create an incident which will point the required moral.

Do not order a retirement, but a unit once halted by the umpire will only advance again with his permission; during a halt the umpire will explain the reason of it.

Do not slow down operations too much; it is obvious that on manoeuvres events move faster than they do when bullets are flying, but do not, on the pretext of reality, keep the troops kicking their heels doing nothing.

Do not create casualties, but notify the commander of the percentage of loss he has suffered.

Do not create unnecessary difficulties.

3. In umpiring night marches the main points were march discipline and the action of aircraft, both friendly and hostile. For this purpose senior officers were stationed at certain points along the route during the night, whilst others visited the billeting areas by day. No halting of troops by order of an umpire was allowed.

4. *Liaison personnel* with the skeleton enemy were made responsible for the preparation of maps for use of the umpires on the other side, showing gun positions and lines of fire of both artillery and machine guns, *vide* Section I.

5. Carrier pigeons were the principal means of communication between umpires in back areas and the headquarters of the chief umpire.

TURKEY AND THE BALKAN STATES.

CLIMATE AND ITS EFFECT ON THE HEALTH OF THE TROOPS AT VARIOUS SEASONS OF THE YEAR, AND ALSO ITS EFFECT ON TRANSPORT POSSIBILITIES.

RUMANIA.

CLIMATE.

Rumania has a continental climate, possessing much in common with that of south-west Russia. The summer is hot. The winter is cold, and at times the country is covered with snow and communication becomes difficult. Spring is short. All through the year the rainfall is rather small. Autumn is the finest season. In the Dobrudja and in Bessarabia the climate is more extreme, both in summer and winter.

There are two winds to which the country is exposed: the Crivat, from the E.N.E., and the Austru, from the W.S.W. These winds at times cause sudden changes in the temperature.

SANITARY CONDITIONS.

The only point which calls for special attention is the prevalence of malaria in the low-lying parts of the country, and more especially in the valleys of the Danube and of the other large rivers, in the Danube delta, and in the Dobrudja. Apart from this, the hygienic conditions of Rumania differ little from those of Central Europe, except that pellagra is chronic among the peasantry; but this disease, unlike malaria, does not attack strangers to the country.

COMMUNICATIONS.

In winter only the main roads are passable for transport, as all the lesser roads become mere mud tracks. Even the main roads, and at times the railways also, are apt to be blocked by snow. River transport is generally impossible in winter, as the rivers, if not actually frozen over, are blocked by floating ice. Even the Danube occasionally freezes sufficiently hard to carry wheeled transport, though seldom for more than a few days at a time.

BULGARIA.

CLIMATE.

A continental type of climate prevails over almost the whole of Bulgaria. The summers are hot, the winters are cold, and the rainfall, although distributed throughout the year, is heaviest in summer. There is a general tendency for cold winds to blow from the north during the winter, but their effect is moderated to some extent by the Balkan Range. In the summer north-westerly winds carry the temperature conditions of South-Central Europe over the greater part of the country. The climate of the Black Sea littoral is rather less severe than that of the country in general.

SANITARY CONDITIONS.

Malaria is prevalent in the lower lying plains and valleys, and notably along the Black Sea coast. Except in this respect, the sanitary conditions do not differ from those of Western Europe as a whole.

COMMUNICATIONS.

As for Roumania, in winter only the main roads are passable, when not blocked by snow. In summer the minor roads are capable of taking wheeled transport, but, in view of their primitive character and the intolerable dust, it is, as a general rule, advisable for all transport, even motor-cars, to take to the fields.

YUGO-SLAVIA.

The climate of Yugo-Slavia falls under two categories. The Dalmatian coast—famed as a holiday and health resort—enjoys a "Mediterranean climate," the remainder of the country has to endure one of the "continental" type. This is due to the fact that the mountains forming the hinterland of Dalmatia form a barrier which cuts off the warm south-westerly winds—which produce the type of climate known as "Mediterranean"—from the interior, which is, on the other hand, exposed to the cold north-easterly winds which sweep across the Balkan peninsula from the steppes of South Russia.

Except on the coast, therefore, the winter is severe. In Belgrade the mean temperature in January is about 29° F., the Danube is not infrequently blocked with drift ice, and occasionally frozen over altogether. In the mountainous portions of the country snow covers the heights from November till March or April. The melting of the snows, coupled with heavy spring rains, is responsible for frequent floods in the low-lying valleys, and even after the subsidence of these floods the ground is often for weeks in too swampy a condition to permit of much military movement.

The summer is everywhere dry and hot, the shade temperature sometimes rising as high as 105° F. Autumn is usually wet.

From the point of view of health the climate is good. The chief danger to be guarded against is the sudden changes of temperature between day and night and between different altitudes, or due to changes in the direction of the wind. Malaria is prevalent in the Monastir plain and in the swampy regions along the rivers.

From the above it will be seen that, provided ordinary hygienic precautions are taken, the Yugo-Slavian climate should not affect operations through adverse effects upon the health of the troops. Its effect on transport possibilities is, however, more far-reaching. It is only in summer that transport would not be handicapped by the weather.

GREECE.

CLIMATE.

The climate of northern Greece—i.e., of Thrace, Macedonia and Epirus—is mid-way between the continental climate of Bulgaria, with its extremes of temperature, and the Mediterranean climate of old Greece, with its hot summer and mild winter. In northern Greece the summer is almost rainless and exceedingly hot, but in spring and autumn the rains are heavy. The winter is temperate.

In old Greece the heat of summer becomes marked about the middle of May, and the maximum temperature is generally reached by the end of July. Upon the coasts and in the islands the high temperature is somewhat reduced by winds from the sea, but in the sheltered lowlands of the interior the heat becomes intense. Except in the northern mountains, the summer is almost rainless, and the streams either dry up to mere trickles of water or disappear altogether. In the high mountain districts the summer heat does not prevail until the beginning of July, and is then not so intense as in the lowlands.

Autumn begins in September, and is characterised by abrupt atmospheric variations; one moment the air is calm and serene, the next rain and the thermometer both fall rapidly. On the whole, however, the autumn is mild and agreeable until November, when winter conditions set in, although the period of greatest cold and heaviest rainfall does not arrive until January.

SANITARY CONDITIONS.

As elsewhere in eastern Europe, the chief obstacle to health is the prevalence of malaria in all low-lying parts of the country. The arrangements for water-supply are exceedingly primitive, even in Athens, and both typhus and typhoid have been on the increase in recent years. Refugees from Asia Minor have introduced a variety of Eastern diseases and the areas occupied by them should be avoided by troops as far as possible.

COMMUNICATIONS.

Except in northern Greece, where in winter the snow lies even in the valleys, the climate does not interfere very considerably with transport. Roads, however, are in almost all cases so primitive as themselves to provide a sufficient obstacle for wheeled transport on any considerable scale, without the assistance of climatic inclemency.

TURKEY.

CLIMATE.

In Turkey four climatic provinces can be distinguished, which differ widely from each other—

Zone A—The north coast or Pontic province, with excessive moisture all the year round.

Zone B—The west and south coasts, with Mediterranean summer and winter seasons.

Zone C—The Central Plateau.

Zone D—Thrace.

In Zone A northerly winds are constant throughout the year and are heavily laden with moisture from the Black Sea. In summer the weather is damp and sultry; in winter it is damp, cold and boisterous. The rainfall in this zone is heaviest in the east, decreasing towards the west.

In Zone B the temperature is high in the summer months, while most of the

rainfall, which averages 25 inches, falls in the winter months, which are very mild. In general, the climate resembles that of Greece and the Mediterranean area.

Zone C has a continental climate which runs to extremes. In summer it is dry with a clear sky and intense heat by day; cool nights are the rule. In winter it is intensely cold, particularly at night, with snow and severe frosts. Campaigning in winter would be impossible for British troops without a proper supply of shelters and fuel. Summer is the driest and spring is the wettest season.

The climate of Zone D has been already dealt with in the article of this series on "Greece."

SANITARY CONDITIONS.

Malaria is the most important consideration. It is prevalent in summer in low-lying areas, round lakes and in the valleys of the larger rivers, notably in the Pontic province. There is little danger to be expected from malaria in the higher parts of the country or in the central plateau, but in the very cold weather there would be a danger from pneumonia to European troops.

COMMUNICATIONS.

Few roads maintain a good condition in extremes of weather; in winter and during heavy rains they are deep in mud and in the heat of summer deep in dust. The roads on the Central Plateau are, of course, most affected by climate, and in winter are likely to be snowblocked. The exact dates between which roads are likely to be impassable will, of course, vary from year to year, but generally it may be said that snow may be expected in mid-November and that by mid-April all roads will be clear. The spring floods are always likely to damage roads and tracks.

UNITED STATES.

TANK DEVELOPMENT.

1. ORGANISATION.—Since the war the Tank service in the United States Army has become part of the infantry branch under the Chief of Infantry.

At the present time it consists of the following units:—

Tank Headquarters.

1 battalion light tanks	...	...	Camp Meade, Maryland.
1 battalion heavy tanks	...	...	Camp Meade, Maryland.
School detachment	...	...	Camp Meade, Maryland.
1 composite tank battalion (373 men)			Infantry School, Camp Benning, Ga.
6 platoons (53 men each) (active)	...		As part of inactive divisions in corps areas.
1 company	...	...	Hawaii.
1 company	...	...	Camp Dix, N.J. (with 1st Div.).
1 company	...	...	Camp Lewis, Wash. (with 3rd Div.).
1 company	...	...	Fort Sam Houston, Texas (with 2nd Div.).

2. PERSONNEL.—There are 111 officers and 1,642 enlisted men, besides civilian employees, including 10 mechanics, in the Tank Service.

There is considerable turnover in the enlisted personnel. The authorities complain that as soon as a man is trained he can get much higher wages in an automobile works or shop, which the majority of men are not slow to take advantage of.

3. **TANK SCHOOL.**—The Tank School is commanded by Colonel S. Simmonds, who recently took over from Brigadier-General S. D. Rockenbach when the latter was promoted.

There are seven instructors, not including officers on duty with organisations (units), who also act as instructors.

Last year 72 officers and 530 enlisted men of the Regular Army passed through the Tank School, also 2 National Guard officers and 6 Reserve officers.

4. **EQUIPMENT.**—The types of tanks at present in the Service are :—

The Mark VIII (heavy).

The 6-ton Renault (light).

There are 100 of the heavy type and several hundred light tanks on hand, all remaining over since the war. These machines are considered practically obsolete, but are useful for training and demonstration purposes and could be used in emergency until something better was available.

5. **POLICY AND DEVELOPMENT.**—Since the war tank experiments and development have been going on as far as the limit allowed by appropriations. No tank units have been issued with new types since the war, and no type can be said to have been finally decided on.

The policy is to develop pilots in order to determine the most satisfactory type to put into production in case of emergency and to have specifications and plans all ready for immediate use when required. Quantity production is not to be attempted at the present time, and the present types are to be continued in the Service until the most satisfactory type of tank has been determined by experiment and trial.

6. **EXPERIMENTAL TYPES.**—The following experimental types have been completed :—

The Christie 14-ton convertible track and wheels, carrying a light gun (2·24 in.), 3 machine guns, and a crew of 3.

Medium A, 1 and 2, weighing 20 to 24 tons, carrying a light gun and machine gun and a crew of 3. In the later of these two types the track has been improved, and there is a semi-pneumatic control. Their maximum speed is 25 miles per hour.

Considerable difficulty has been experienced with the transmission from the engine to the track, partly due to the fast-running engine utilised, unsatisfactory design of change-speed and reverse gears, and attempting too great a range of speed.

Experiments are being carried out on similar lines to our own, including the use of hydraulic transmission, with which it is understood no great advance has yet been made. It would appear that the present tendency is to use a slower-running heavier engine, with not more than 2-speed epicyclic gears.

It was considered by the military authorities that the weight of the medium tanks was excessive, and should be reduced to 15 tons, which is the limit placed on the weight a pontoon and similar bridge can bear. Consequently, the following types are now under construction :—

Christie, 9 ton, which is a smaller edition of the Christie mentioned above.

Medium, 15 ton, which has several improvements in the track, transmission, pneumatic control, etc., on the present types of this class.

Although several tank expert officers have said that they consider a speed of 12 miles per hour is all that is required, they consider it would be a valuable

asset to be able to travel at a high rate of speed in emergency. In the newer types a speed of 25 miles per hour, or even greater, is being aimed at.

7. TANK SMOKE SCREENS.—The Chemical Warfare Service are developing a smoke curtain for use in tanks. The 6-ton tank has been fitted up with one of these, and experiments in the laying of smoke screens by tanks are now being carried out.

8. ANTI-TANK DEFENCE.—While it is considered that the best solution to the anti-tank problem is another tank carrying a 6-pdr. or 75-mm. gun, it is thought that for some time to come direct fire from a light field gun within 1,000 yards range will be the best anti-tank defence.

The present type of 75-mm. gun is held to be deficient in traverse for the purpose; but it is considered that the 75-mm. gun now in course of development by the Ordnance Department with 45° traverse, will meet all requirements.

9. CO-OPERATION OF ARTILLERY AND TANKS.—The authorities are of opinion that artillery can best support tanks by laying a smoke screen in front of them and blinding hostile observation. Not much faith is placed in counter-battery work, and it is thought that the tank itself can deal with the anti-tank gun if it can get within striking distance.

10. TACTICAL EMPLOYMENT.—The ideas as regards tactical employment of tanks appear to be faulty. The tendency seems to be to attach single tanks, or pairs of them, to companies and battalions as an auxiliary arm to assist them in their ordinary rôle of progress under fire, thus dissipating the power of the tank arm on, so to speak, minor ventures, rather than concentrating it under the Higher Command for use on special occasions.

It is true that the importance of a tank reserve is recognised, but there is a distinct tendency to fritter away a considerable part of the available power piecemeal.

11. GENERAL.—The U.S.A. appear to be endeavouring to develop one type of tank with sufficient speed, protection, power of armament and lightness of weight (15 tons or less) to meet all requirements.

There are many who consider that this is unattainable and that it will be necessary to have two types—a medium and light. There are others who believe that the correct line of development lies in a "cross-country" vehicle, with a chassis which can be used for either military or commercial purposes. This school maintains that an armoured body of suitable type can easily be converted into a formidable tank, and that on account of the great commercial demand large numbers will be available in emergency.

In the meantime the authorities are concentrating on a type of 15 tons or less, with the possibility of a tank of 5 tons, which on occasion can be transported on a truck.



ROYAL AIR FORCE NOTES.

APPOINTMENTS.

ADDITIONAL AIR AIDE-DE-CAMP TO HIS MAJESTY.—His Majesty the King has been pleased to approve the creation of an additional Air Aide-de-Camp to the King. There are now one Principal Air Aide-de-Camp (Air Marshal Sir J. M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O.), and two Air Aides-de-Camp (Group Captains C. F. Kilner, D.S.O., and L. W. B. Rees, V.C., O.B.E., M.C., A.F.C.).

MARSHAL OF THE AIR.—His Majesty the King has been pleased to approve the change of the title of the most senior rank in the Royal Air Force from "Marshal of the Air" to "Marshal of the Royal Air Force." This rank corresponds to that of Admiral of the Fleet in the Royal Navy and Field Marshal in the Army.

AIR ESTIMATES 1925-26.

The net expenditure authorised for 1925-26 under the Air Votes is £15,513,000, and the gross figure is £21,319,000. The difference between these two sums is accounted for by there being a charge of £3,116,700 on the Colonial Office, representing the Middle East Vote (Iraq, Palestine and Transjordan), and of £1,320,000 on the Admiralty, representing the cost of the Fleet Air Arm. These sums, together with other repayments and appropriations-in-aid, are shown as contributions towards the gross Air Votes.

STRENGTH AND DISTRIBUTION OF THE AIR FORCE.—Apart from training units and establishments, the present strength of the Air Force is equivalent to 54 squadrons—43½ squadrons at full strength and 21 flights of an average strength of six machines (half the normal) provided for the Fleet Air Arm or for operating from coastal bases. Of the 43½ squadrons, 25½ are at Home, 8 in Iraq, 6 in India, and 4½ in Egypt and Palestine.

The number of completely-formed Regular Squadrons for Home Defence is 18. During 1925-26 the number of Squadrons formed will be: Regular, 2; Special Reserve, 1; Auxiliary Air Force, 4.

The strength of the Fleet Air Arm will be increased towards the end of the year by four additional flights.

The Air Squadrons in Iraq will remain at 8, but garrison will be reduced by the Indian Pack Battery being withdrawn during the present trooping season, and the Armoured Car Companies will be reduced from four to three.

The Air Force in Palestine has recently been reduced by one flight. Three machines will be maintained at Aden.

PERSONNEL.—The maximum numbers to be borne or attached to the Air Force during the year is 36,000, an increase of 1,000. The additional personnel is required for the new Home Defence Scheme.

TECHNICAL EQUIPMENT AND RESEARCH.—There is a net increase of £763,000 on the sum allocated to this vote. This is mainly due to the new squadrons being formed for Home Defence and to larger orders for modern aircraft.

The Royal Aircraft Establishment at Farnborough will continue to be reserved for experiment and research. It will not be employed on normal production.

(See also Airship Notes.)

ORGANISATION, ADMINISTRATION AND TRAINING.

HOME DEFENCE FORCE.—The first stage in the development of the Home Defence Force was completed on 1st January, 1925, by the addition of the necessary 11 flights to complete the first 18 squadrons.

ROYAL AIR FORCE STAFF COLLEGE.—The course commencing on 1st May, 1924, terminated on 1st April, 1925. The College reopens for the next course on 1st May.

SPECIAL RESERVE AND AUXILIARY AIR FORCE STATIONS.—Work has been commenced at Aldergrove, Renfrew, and Turnhouse, to prepare the stations for the S.R. and A.A.F. Squadrons it is intended to form there.

FULL DRESS.—His Majesty the King has been pleased to approve the wearing of aiguillettes of various patterns by Air Members of the Air Council Equerries to the Royal Family, Air Aides-de-Camp and Air Attachés.

EMPLOYMENT OF EX-SHORT SERVICE OFFICERS.—The Officers' Association have undertaken to carry on as from 1st April, 1925, the work of assisting ex-short service officers to obtain employment. This work has hitherto been carried out by the Ministry of Labour.

NAVAL CO-OPERATION.

(See also "Fleet Air Arm"—Naval Notes.)

The aircraft from H.M.S. "Eagle," "Hermes" and "Argus," took an active part in the combined manœuvres during the presence of the Atlantic Fleet in Mediterranean waters.

The Air exercises took several forms and a large number of flights were made. The chief activity in naval co-operation work has taken place at Malta, where No. 481 Flight and other Flights, disembarked from carriers, have maintained a regular routine of training and co-operation exercises, with ships and shore units at Malta.

ARMY CO-OPERATION.

Royal Air Force units are to co-operate with all Home Commands during the Army training between June and September this year. In addition to the four Army Co-operation Squadrons, two bomber and fighter squadrons are to take part.

FORTHCOMING EVENTS.

ROYAL AIR FORCE DISPLAY.—The Royal Air Force Pageant, which was instituted in 1920, has now been re-named the Royal Air Force Display. It will take place on Saturday, 27th June, at the London Aerodrome, Hendon. His Majesty the King, Chief of the Royal Air Force, hopes to be able to attend.

This annual review of the flying units is an integral and important part of the annual training of the Royal Air Force, and provides a valuable stimulus to keenness and efficiency in the many squadrons taking part in the inter-unit competitions and displays.

A programme has been arranged which will fully equal that submitted in previous years, and new features are being introduced which will enable the public to appreciate the developments that are constantly taking place in the aerial arm.

Full details of the programme will be issued at a later date.

As in the case of the Royal Tournament, all the proceeds are devoted to Service charities.

OVERSEAS COMMANDS.

IRAQ.

During December, January and February the situation in Iraq has been fairly settled.

SULAIMANIYAH.—Operations against Shaikh Mahmoud in the Sulaimaniyah area were continued during December, and the task of destroying his winter quarters and supply dumps was finally completed. The operations, which extended over a period of 28 days, were carried out under very adverse weather conditions, despite which the machines flew 230 hours with only one forced landing.

Towards the end of December, Government officials carried out a tour in the areas N.E. of Sulaimaniyah, which was completely successful, the villages everywhere displaying a friendly spirit.

The area around Sulaimaniyah is steadily coming under effective Government control and Mahmoud's sphere of influence is becoming more and more restricted.

Mahmoud has kept constantly on the move since the beginning of the year, busily engaged in collecting together a new following. At the end of February his supporters were estimated as 232 foot and 150 horse.

On 5th January, No. 30 Squadron dropped proclamations over the Jaf country, between Kifri and the Diala river, warning the tribes that air action would be taken against them if all loot taken from a caravan which they had raided during November was not returned immediately and the persons responsible surrendered. The warning being ignored, the flocks and tents of the tribesmen were attacked on the 8th, 10th and 11th. This punishment had the desired effect, and the chiefs concerned surrendered.

AKHWAN RAIDS.—Southern Iraq was troubled by the activities of Akhwan raiders at the end of the year.

The first raid occurred on the 26th December, Iraq shepherd tribes who were in the vicinity of Umm Rahal (35 miles S.W. of Jaliba) bearing the brunt of the attack. Owing to adverse weather conditions, it was not possible to take air action until the 28th, when No. 84 Squadron located the raiders near Adan, 35 miles south of the scene of the raid. They were proceeding towards the Nejd frontier and were scattered in small parties over a large area, evidently not expecting any retaliatory action. When air action commenced, they quickly took to flight, abandoning their loot. On the 29th they were again located and bombed from low heights. No further action was possible against these raiders before they crossed the frontier.

A few days later another raid took place. The raiders were first located on the 6th, collecting loot near Nukrat Selman. They were again located on the 7th proceeding in a southerly direction, and air action was taken against them with good effect. They were also attacked on the three following days, and were finally driven over the frontier on the 10th.

The total casualties to Iraq tribes caused by these raids is estimated at 75 killed, whilst the raiders lost about 50 killed.

On the 15th January, tribes near Sharaf (95 miles south of Najaf) were the victims of a third raid; 33 men were killed and over 4,000 sheep looted.

During February another raid was directed against tribes west of Najaf. An aerial reconnaissance passed the vicinity whilst the raid was in progress, and the sight of the machines caused the raiders to retire with practically no loot, and no further raids were carried out in the immediate vicinity.

During January and February frequent reconnaissances have been made in the vicinity of the Akhwan frontier, both by air and by the armoured car

companies, with a view to preventing any further activities of Nejd raiders. A detachment of the Iraq Army has been stationed at Abu Ghar (25 miles S.W. of Jaliba) with a view to the collection of early information re impending raids. Two Armed Ford cars are also stationed there, and a wireless station has also been erected.

Nos. 3 and 4 Armoured Car Companies also carried out extensive reconnaissances during December, in the sand belt south of Samawah and in the area between Najaf and Samawah. A considerable amount of aerial co-operation was rendered by No. 84 Squadron during these operations.

NORTHERN FRONTIER.—The Commission appointed by the League of Nations is still at work investigating the condition of affairs on the Northern Frontier.

TRAINING.—Training has proceeded along normal lines, except in the case of the squadron which during December was employed in the Sulaimaniyah operations, and in the units engaged on the air route.

INDIA.

OPERATIONS.—The Royal Air Force has only undertaken punitive operations on one occasion during the period under review. On the 24th January, a gang of Guri Khel raided a contractor's camp at Manzai, carrying off four Hindus and 28 bullocks. They were warned that they would be subjected to air action in default of submission to Government terms. Operations were accordingly commenced on the 9th March, Nos. 5, 27 and 60 Squadrons being engaged. Further details are not yet available.

A.O.C.'s TOUR OF INSPECTION.—Between the 27th October and the 12th November the Air Officer Commanding made a rapid tour of all R.A.F. units in India. The total distance flown was about 3,000 miles.

On the 25th November, four machines of No. 20 Squadron flew to Aundh (near Poona) from Quetta to co-operate with troops of the Southern Command at a practice camp. The route followed was *via* Sibi, Jacobabad, Pad-i-dan, Hyderabad, Uterlai, Jodhpur, Ahmedabad and Deolali, a total distance of about 1,350 miles. All machines arrived at Aundh on the 1st December.

TRAINING.—Training has been carried out during the period under review, and a large amount of work has been carried out in co-operation with the Army.

EGYPT.

The situation in Egypt has been normal during the period under review. The Flight of No. 47 Squadron still remains at Khartoum.

The usual training and co-operation with the Army has been carried out.

PALESTINE AND TRANSJORDAN.

Training and co-operation work has proceeded on normal lines.

During December and again in January an armoured car convoy visited Azrak, and various road reconnaissances have also been carried out.

The 9th Lancers, who were sent to Egypt in connection with the trouble last November, returned to Palestine on the 19th March.

ADEN AND SOMALILAND.

The Flight at Aden and the Somaliland detachment have carried out various reconnaissance flights in addition to the normal training and co-operation work.

During December an interesting flight was made to Landar in the Andali country, 125 miles from Aden. The flight had to be undertaken relying on a

traveller's description, as this part of Arabia is entirely unsurveyed. The information available was found to be fairly accurate and little difficulty was experienced.

AIR ROUTES.

The Cairo-Baghdad Service Air Route continues to operate regularly. Air Route duties have been carried out by Vernon, Vimy, and in one case by D.H.9A aircraft. The total amount of mail carried between October and January was 3,872 lbs.

CIVIL AVIATION.

LIGHT AEROPLANE CLUBS.—The Air Ministry has been engaged for some time past in working out a scheme for the establishment of Light Aeroplane Clubs, which will be financially assisted in their early stages by the Government.

The competition for two-seater light aeroplanes held last year was successful in producing the type of aircraft required, and reliable engines of suitable power, which were not then available, have since been developed and will be ready for service this summer.

Under the scheme now being considered, six clubs will be recognised and assisted. Each club is offered two complete dual-control light aeroplanes and one spare engine, to be followed later by further equipment or the balance in cash for this purpose, to a total value not exceeding £2,000 to each club. Further, a grant to each club not exceeding £1,000 will be made for one year by the Air Ministry towards the expenses, and at the end of the first year of operation the financial position will be reviewed, and a further grant will be made for the second year, which again will not exceed £1,000. In addition, a capitation grant of £10 per head will be paid for each member of the club who is trained *ab initio* on club aircraft and obtains his "A" licence. Each club will be required to make its own financial arrangements for aerodrome and shed facilities, and will have to employ one or more qualified pilot instructors, ground engineers, and mechanics, as may be considered necessary by the Air Ministry.

NORTHERN AIR LINES, LTD.—This company commenced operations on the Carlisle-Stranraer-Belfast route on the 17th March. In spite of somewhat unfavourable weather conditions, the service has run practically to schedule on each day. The company is carrying a full load of newspapers to Belfast in the early morning, and is bringing back a certain number of evening papers for early distribution in S.W. Scotland, which is at present badly served in respect of evening papers. Also, a certain number of passengers are being carried. Tests are being made of the utility of the service for mail-carrying, and it is probable that an air mail will be commenced in April. Great interest is centred on the operations of this company, as it is the first company to operate in Great Britain without the assistance of a Government subsidy.

AVIATION IN FOREIGN COUNTRIES.

FRANCE.

NAVAL AVIATION.—*Estimates.*—The Estimates for the Naval Air Service for 1925 were passed by the Chamber of Deputies on 12th February. During the general discussion of these Estimates, M. J. L. Dumesnil, Minister of Marine, made some interesting allusions to the manner in which the Estimates would be expended during the financial year 1925.

He said that he hoped to form six new Naval squadrons during the year, which would bring the present total up to 104 squadrons.

The conversion of the "Béarn"¹ would be proceeded with and her complement of aircraft obtained in readiness for her commissioning, which would probably take place early in 1926.

He hoped that it would be possible during the year to establish a war reserve of aircraft sufficient to carry over the first four months of hostilities.

For the formation of the six new squadrons, for the re-equipment of existing units, and for the formation of the war reserve, he proposed to purchase 200 aircraft during 1925. He did not intend to construct any new airships.

This programme is, of course, dependent upon the final passage of the Estimates by the Senate, in which house they have not yet been discussed.

Air Base at Cherbourg.—There have recently been allusions in the press to the formation of a large air base at Cherbourg. These are in the main inaccurate. It is the intention of the French Government to construct a small aerodrome at Querqueville, near Cherbourg, at which will be stationed one squadron of single-seater fighter aircraft.

The Naval Air Station in Cherbourg Harbour is being improved and enlarged. A mole is being built out with the object of facilitating the hoisting of large flying boats in and out of the water, and also to increase the area of sheltered water for landing.

Formation of a new Squadron at Bizerta.—A new squadron has been formed at the existing station at Bizerta. This consists of nine Farman Goliath torpedo-planes, fitted with two 400-h.p. "Jupiter" engines. These machines are a modification of the old Farman Goliath which has been in use as the twin-engine bomber of the Army Air Service for some years, the two "Salmson" engines having been replaced by "Jupiters" and floats fitted in place of wheels.

MILITARY AVIATION.—In consequence of certain accidents which have recently occurred, the causes of which have been definitely traced to foolhardy flying and low stunting by pilots of the Military Air Service, the Ministry of War has decided to institute a system of registration marks on all military aircraft. These marks will be in a form similar to those carried by civil aircraft under the International Convention. They will consist of one figure and three letters. Registration figures and letters are now being allotted to all units of the Military Air Service and in the near future all machines will be so marked.

Shortage of Observers.—In view of the shortage of observers in the Military Air Service to which reference was made in the last issue of these notes, the Ministry of War have decided that in the future all officers enrolling in the Military Air Service shall receive instruction in the duties of an observer, and that all subaltern officers now in the Military Air Service shall be trained in these duties forthwith.

FRENCH AFRICA AND BELGIAN CONGO.

Three flights of note have been carried out over Africa recently—the first two French, and the third Belgian:—

- (1) Colonel de Goys's expedition, comprising two Blériot 115 machines, a commercial type of aircraft with four 180-h.p. Hispano-Suiza engines, left France on 18th January with the intention of flying to Bangui in

¹ See Naval Notes.

French Equatorial Africa, by way of Lake Chad. The first machine was piloted by Colonel Vuillemin, and the second by Capitaine Pelletier Doisy, who flew from Paris to Tokio last year. The flight was made in easy stages *via* Perpignan, across the Mediterranean from Carthage to Oran, thence across the Sahara *via* Colomb Bechar—Adrar—Wallen—Tessalit to Niamey, on the River Niger. At this point one of the machines crashed on 10th February, and the rest of the flight as originally planned to Lake Chad and Bangui was necessarily abandoned, the remaining machine having been ordered to go instead to Dakar.

(2) On the morning of 3rd February, Capitaine Lemaitre and Lieutenant Arrarchard, of the French Military Air Service, left Paris in a Bréguet XIX B.2 (480-h.p. Renault engine), on an attempt to make a non-stop flight to Dakar in French West Africa. They flew continuously for 28 hours, but were finally compelled, owing to fog, to land near Villa de Cisneros, the capital of the Spanish possession of Rio di Oro, after having covered 2,400 miles. The remaining 465 miles to Dakar were successfully accomplished the following day.

(3) On 12th February, Lieutenant Thieffry, a Belgian Military Air Service officer who gained considerable distinction during the war, left Brussels for Kinshasa in the Belgian Congo on a Handley-Page W.8F. The machine is a commercial type fitted with one 375-h.p. Eagle IX Rolls-Royce engine and two 230-h.p. Siddeley Puma engines. The flight is not in the nature of a "Raide," one of its objects being that the machine which is being flown shall be used on arrival in the Belgian Congo to inaugurate the opening of the Kinshasa and Luebo air route, which is now ready. Particulars of this route were given in the last number of this *Journal*. Lieutenant Thieffry was last reported on the 16th March to have landed on the banks of the River Shari, between Fort Lamy and Firt Archanbault in French Equatorial Africa.

GERMANY.

During this summer an increased aeronautical activity in Germany may be expected.

Numerous flying meetings and competitions are already arranged, and it is of interest to note that the competitions are directed towards developing the efficiency of small machines.

In the four main competitions, the owner, pilot and machine must be German; but, owing to the lack of low-powered German motors, foreign engines may be used in the smaller aircraft.

ITALY.

SUPPLEMENTARY AIR VOTE.—The passing of the Air Vote for the current financial year—June, 1924, to June, 1925—at the figure of 399,000,000 lire (approx. £3,990,000) was reported in the last number of this *Journal*. A Supplementary Vote of an additional 51,000,000 lire has since been passed, bringing the total vote to 450,000,000 lire (approx. £4,500,000).

MEETING OF REPRESENTATIVES OF AIRCRAFT INDUSTRY.—A meeting between representatives of the Italian aircraft industry and Heads of Departments of the Italian Air Ministry was held at Rome at the end of January to discuss the industrial programme for 1925. In a speech on the problems of industrial production and organisation, General Bonzani (Under-Secretary of State for Air) produced data to show that Italy was the second Air Power in the world. He

stated that the situation as regards aircraft production was satisfactory. Fifteen new types of machines had recently been presented for test. The construction of foreign aircraft under licence was progressing well. The firms had adapted themselves to mixed wood and metal, and all-metal construction, with credit. Difficulties had, however, been encountered with regard to the production of an engine of 400 to 500 h.p. (a type of which the Italian Air Force stands in need).

AIRCRAFT CATAPULT-LAUNCHING EXPERIMENTS.—Experiments in launching aircraft from the decks of battleships by means of a catapult were carried out at the Royal Arsenal, Spezia, on 9th February. The catapult consisted of a trolley set on rails and actuated by compressed air. With the engine and the aircraft running, the trolley attained a speed of 67 miles per hour. The catapult was first tested with a weight of 2 tons, and gave satisfactory results. A Nieuport machine without pilot was then placed on the trolley. The experiment in this case, however, proved a failure owing to the tail of the machine catching in the guide rails of the trolley as it was about to leave it, and consequently throwing it into the sea. Experiments will be continued with a larger trolley.

INTERNATIONAL RECORDS.—On 4th, 9th and 10th February, a Dornier-Wal Flying Boat, equipped with two Rolls-Royce Eagle IX engines and built by the Dornier firm in Pisa, succeeded in breaking a number of world's flying records. The most important of these were as follows:—

- (1) Seaplane altitude record with 1,500 and 2,000 kilogrammes of useful load. Heights of 10,072 ft. and 9,860 ft. were reached respectively.
- (2) Endurance record with useful loads of 1,000, 1,500 and 2,000 kilogrammes—distances of 314 miles in the first two cases and 157 miles in the last case having been covered.
- (3) Speed records with useful loads of 250, 500, 1,000 and 1,500 kilogrammes, varying from 108 miles per hour to 106 miles per hour.

An interesting feature of this machine is the fact that its two engines are set in tandem.

CIVIL AVIATION.—Arrangements have been made to inaugurate a new civil air line which will operate between Brindisi and Constantinople—beginning, it is hoped, in July, 1925. The firm which will operate this line is known as the Aero-Expresso, and though a private concern it will be subsidised by the Government. The machines used will be all flying boats, and the choice has at present fallen on the S.55 built by the Italian firm of Savoia.

AIRSHIP NOTES.

GREAT BRITAIN.

AIR ESTIMATES, 1925-26 (AIRSHIPS).

AIRSHIPS.—An initial provision of £350,000 was made in last year's estimates for a programme of airship development in two parts, to be proceeded with concurrently and extended over three years. It was arranged that one new airship would be constructed by the Air Ministry, the other by the Airship Guarantee Company. Originally, also, it was intended that the former should initiate a scheme of development under the direct control of the Air Ministry, and that the other should form the nucleus of a commercial airship service.

The new Secretary of State for Air, however, is of opinion that a commercial service is at present the principal object to be kept in view. The programme is in future, therefore, to be kept sufficiently elastic to render it possible to accelerate the transition to a phase of commercial operation.

The immediate policy is to secure that every step is taken to ensure safety and success in the experimental stages, especially as the new ships are to be twice as large as any previously constructed.

The total provision for airship construction in the current estimates is £500,000.

AIRSHIP DEVELOPMENTS.

AIRSHIP STATIONS.—The Royal Airship Works at Cardington and the Airship Station at Pulham were re-opened in July. The shed at Cardington is now being enlarged for the construction of the Air Ministry ship.

Mooring masts are being constructed at Cardington and at two stations overseas for the new airships. The existing mooring mast at Pulham has been reconditioned for the trials of "R.33."

EXPERIMENTAL WORK.—Exhaustive trials of experimental girders are now in progress and the Air Ministry ship will not be actually laid down until these are completed.

"R. 36."—This airship is now being reconditioned at Pulham for an experimental flight to Egypt after it has been tried out at the Cardington mast.

TESTS OF AIRSHIP "R. 33."—The recent flight of "R. 33" from the Royal Airship Works, Cardington, to Pulham Airship Station marks the beginning of a series of full-scale aerodynamic investigations which the Air Ministry has undertaken with the object of providing technical data which have hitherto not been available to airship designers either here or abroad.

The Accidents Investigation Sub-Committee of the Aeronautical Research Committee was requested by the Air Ministry in 1921 to carry out an investigation of all technical details which contributed to the accident to the "R. 38." One of the conclusions arrived at by the Sub-Committee was that research by both model and full-scale experiment was essential to determine and verify the forces to which an airship is subjected.

Research on a model of the airship has been carried out in the wind tunnels at the National Physical Laboratory and the results there obtained will be available for comparison with the full-scale experiments. The data to be obtained from these experiments, together with the theoretical work on airship design which has been carried out in the last few years, will be of the utmost value, and will be available to the Airship Guarantee Company, which is building a 5,000,000 cu. ft. commercial airship, as well as to the Air Ministry, which is building an airship, the "R. 101," of similar size.

Special apparatus has been devised for the purpose of obtaining the data required.

For the trials necessary to obtain an accurate estimate of the aerodynamic forces which will be imposed on an airship under all types of manoeuvres, "R. 33" has been fitted up with over 200 special orifices or small tubes, and the pressures which occur on these orifices during different flying manoeuvres will be recorded simultaneously by electrical means on a number of special manometers.

It is also desired to ascertain as accurately as possible the mass of air which accompanies "R. 33" when manoeuvring in flight, and for this purpose the ship has been fitted with a special moving pointer which is followed by the helmsman in order to impose a prescribed motion on the rudders. The resulting motion of the ship in space is obtained by simultaneously photographing with a cinema camera a number of instruments fitted in the control car, and this again is checked by flying the ship over a camera obscura on the ground, on the table of which its motion is recorded. From the motion of the airship, it is possible to estimate the effect of the mass of air which is moved with it.

These arrangements will make it possible to determine how much pressure is put on various parts of the airship by any particular evolution or by sudden gusts of wind, either when in flight or when moored to a mast; and, together with other experiments which are being carried out, should provide that technical information which has been lacking in the past.

"R. 33" CARRIES AWAY MOORINGS.—On arrival at Pulham, Norfolk, at which station the full-scale trials will be carried out, the "R. 33" was moored to a mast. Extensive trials of the mast system of mooring were carried out with "R. 33" and "R. 36" at Pulham in 1921, during which an airship rode out a wind which at times reached a velocity of 60 miles per hour and made successful landings at the mast in winds up to 30 miles per hour with the assistance of a landing party of 10 men, as compared with a party of 300 or 400 which was required to take an airship into its shed in winds of 20 to 25 miles per hour. The gear used at Pulham in 1921 was of a somewhat primitive nature, and a traction engine took the place of the main winch; but the mast was re-conditioned, and improved apparatus installed for the forthcoming trials.

At 10 a.m. on 16th April, in a strong gale, "R. 33" tore away the head of the mooring mast and was driven out over the North Sea as far as the coast of Holland. The nose of the airship was badly damaged against the rail surrounding the boarding platform. In spite of this, "R. 33" rode out the gale successfully and returned safely to the Pulham shed by four o'clock the following afternoon.

Disaster was undoubtedly averted through the fine handling of the damaged airship by the second-in-command, Flight-Lieutenant R. S. Booth, A.F.C., R.A.F., and a reduced crew, who were keeping watch on board when the moorings parted.

Flight-Lieutenant Booth was a sub-lieutenant in the Navy at the beginning of the war and obtained his first experience of airships in the Royal Naval Air Service, flying dirigibles.

"R. 33" was built in 1918-19 by Messrs. Armstrong, Whitworth & Co., a Barlow, near Selby, Yorks. She is the first duralumin ship to be completely reconditioned and, in the process of reconditioning, every detail has been most carefully inspected and overhauled, the work being carried out by the Royal Airship Works, Cardington, under the inspection of the Aeronautical Inspection Directorate. It was feared that the duralumin of which the ship is constructed might have suffered deterioration while the ship was laid up. Only a few parts of the structure have, however, had to be replaced, and in general the framework, although six years old, was found to need comparatively little renewal. Repairs to the damaged nose were taken in hand at once and were to occupy only a few weeks.

Note.—A photograph of "R. 33" in flight appeared in the February number of the JOURNAL.

ITALY.

AIRSHIP CONSTRUCTION.—Italy has two small semi-rigid airships at present under construction. These are as follows :—

- (i) "Mr. 2." This is in every respect the same as the "Mr. 1," which was constructed during the summer of 1924, except that it will carry two 30-h.p. engines, instead of one. It is also proposed to provide it with variable pitched propellers. Its dimensions will be :—

Length ...	105 feet.
Width ...	24 "
Height ...	41 "
Cubic capacity...	90,000 cubic feet.

It should be noted that this and its sister ship, the "Mr. 1," are the two smallest semi-rigid airships in the world.

- (ii) "N" type. This ship is being built for rapid reconnaissance, and will be provided with two 200-h.p. Spa engines. She will have one control car and two power eggs. Its dimensions will be as follows :—

Length ...	270 feet.
Width ...	43 "
Height ...	56 "
Useful load ...	5,840 lbs.
Range ...	700 miles in 14 hours.
Cubic capacity	247,000 cubic feet.

The programme for the present year allows for the construction of two more airships, one similar to the "N" type described under paragraph (ii) above, and another of 671,000 cubic feet which will be similar in every respect to the "N. 1," which made its maiden flight in March, 1924, except that it will carry a bigger load and, it is hoped, have a greater speed and higher ceiling.

UNITED STATES OF AMERICA.

RIGID AIRSHIP "LOS ANGELES" ("Z.R. 3").—Since the rigid airship "Los Angeles" was handed over by the Germans to the United States Naval Air Service, it has been inflated with helium gas, taken partly from the reserve supply in storage and partly from the gas cells of the airship "Shenandoah."

Water recovery apparatus has also been installed, and is reported to have given satisfaction.

As the "Los Angeles" cannot be used for military purposes, having been built in Germany, it is intended to use it for training lighter-than-air *personnel* of all grades; and also for long-distance test flights with a view to proving or disproving its usefulness for commercial purposes. A strict account is being kept of its cost of operation.

Several training flights have been made, and mooring practice has been carried out, both to a land mast and to the mast erected on the airship tender, U.S.S. "Patoka."

A flight lasting 12½ hours was made, carrying numerous scientists and photographers, who were able to make observations on the occasion of the recent eclipse of the sun.

On the 22nd of February the airship made a flight from its base at Lakehurst, New Jersey, to the Bermuda Islands, carrying 40 passengers and covering the distance of 676 miles in 12 hours. It was intended to moor to the U.S.S. "Patoka," which was waiting at the Bermudas for this purpose. Owing, however, to a very high wind, no attempt was made to do so; and, after circling round for some time, a bag of mails was dropped, and the airship returned to Lakehurst.

REVIEWS OF BOOKS.

Official History of the Great War. Military Operations. France and Belgium, 1914. Second volume. Compiled by BRIGADIER-GENERAL J. E. EDMONDS, C.B., C.M.G., R.E. (Retired), *p.s.c.* (Macmillan & Co.)

This second volume of the official history of the operations in the Western theatre completes the story of 1914, opening with the attempt to save Antwerp and closing, on a note of tragic but triumphant grandeur, with the definite bolting and barring of the route to the Channel ports. Its main theme is that series of battles round Ypres in 1914 more familiarly known as "First Ypres." This continued fighting might, in a sense, be termed the Thermopylæ of the British Army; but it ended entirely victorious in both the moral and the military sense. Here it was that the original British Expeditionary Force spent itself and thereby gained immortal renown, for its superb and protracted resistance not only procured a breathing space in which the New Armies could be recruited and organised, but it cured the enemy for a long time to come of any desire of seeking a decision in the West. "It had created such an impression on the Germans that their leaders turned aside to seek for less stubborn foes and left the British sector alone, attempting no serious attack on it for three long years." These two 1914 volumes might be termed the glorious epitaph of the old Regular Army: thenceforth its survivors were to be but the leaven of a national army. In these battles of 1914 the Regular Army fought as an organic whole and was the sole shield of the Mother Country and the Empire. In treating so great and splendid a subject, General Edmonds has wisely chosen a style of stark simplicity, such as characterises our material monuments to those who fell, since literary embellishment or ornate eulogy would but mar a story already majestic and unique in itself. An uninterrupted series of battles, prolonged over several weeks, relatively static compared with the rapid movements and startling changes of August and September, might well be confusing and monotonous in narration. Yet this has been skilfully avoided: the book is readable—intensely so—both by the layman and by the expert. For the military student, no point is more valuable than the successive notes, after each phase, giving the German plans and movements.

The volume opens with a chapter devoted to the expansion of the Army and of available military supplies, as well as to the work that was being done at home under the cover afforded by the original B.E.F. On the Antwerp expedition around which controversy has raged, its verdict is a striking justification of this much-abused move—"it had a lasting influence on the operations." "The advantage of a day, nay even a few hours, in the advance of the Germans on Ypres might have tipped the scale to the enemy side."

The narrative then deals with the abortive outflanking "race to the sea," best summed up in Gallieni's Memoirs—that the Allies "were always 24 hours and an army corps behind the enemy." It traces in turn the transfer of the IInd Corps from the Aisne, the Battle of La Bassée, and the Battles of Ypres, 1914, each act opening with an encounter battle, and passing through an Allied offensive phase before relapsing under compulsion into passive defensive. The reader is left with the impression that the higher command was guided rather by an unreasoning faith in success rather than by the facts supplied by the intelligence branch, and that our ultimate defence might have been less imperilled if we had not tried to resume the offensive at every dubious opportunity. On the other hand, the German command emerges even worse out of the examination, and no point is more notable than that the Germans, though they many times

broke in, never broke through despite their superiority of force. The exploitation of local success was and remained the supreme problem of the Great War. The comparative neglect of this all-important feature of modern battles in the post-war manuals is surprising and ominous; the Germans alone, smarting under defeat, seem to have learnt the lesson.

But on our side any miscalculation in the higher leading was redeemed by the tactical ability of the fighting leaders, the high standard of weapon training, as well as the invincible spirit of all ranks. Ypres, 1914, will always be remembered for British endurance, British musketry, and the British knack of improvisation—by which the repeated cracks in the human wall that girt Ypres were “puttied up” by the bold and skilful use of small reserves drawn off from other parts of that line.

In this connection, it is a fact worthy of a final note that the official history restores to its full glory and importance the famed counter-attack of the Worcesters at Gheluvelt.

Yet this one incident is only typical of the spirit that animated the entire B.E.F. To have brought into clear relief the outlines of this great struggle, so complex and so involved, is no small achievement, and the method of General Edmonds's presentation of the story deserves the attention of every military historian.

Annals of an Active Life. GENERAL THE RT. HON. SIR NEVIL MACREADY, Bart., G.C.M.G., K.C.B. 2 vols. (Hutchinson & Co.)

Sir Nevil Macready's career in the Army was in no ways ordinary, and he has, therefore, been able to write two volumes of truly interesting and unusual memoirs.

He begins with a pleasing chapter dealing with his home life, which affords a good insight into the life of his father, William Macready, the celebrated actor. Browning and Dickens also figure in these pages. Soon after leaving school, young Macready entered the Gordon Highlanders, and his career from that point up to the end of the South African War offers no features that differentiate him from other successful young soldiers of the period. Tel-el-Kebir and Ladysmith are now threadbare subjects, but the author's adventures in Zululand are more novel and refreshing.

The real interest of the book begins with the writer's appointment as A.A.G. at the War Office in 1907. The development of the future A.G.'s work in the field is full of interest. There is a remarkable sketch of the coal strike in South Wales during 1910, when Sir Nevil commanded the troops despatched to support the police. Any officer called upon to serve in a like crisis could not do better than to ponder over these pages, even though modern labour conditions and the passing of the Emergency Powers Act of 1920 have greatly modified this most difficult problem.

Early in 1914 Sir Nevil was sent to Ireland in connection with the tension that was arising in consequence of the formation of the Ulster Volunteers and of the Irish National Volunteers. His attitude leant towards dealing impartially with both sides as law-breakers should they resort to any form of violence. The outbreak of the Great War brought Sir Nevil back to London and thence to France as A.G. One single chapter, full of pithy personal reflections, deals with the writer's work with the B.E.F. until, in January, 1916, he was recalled to become A.G. at the War Office. The next three chapters deal almost wholly with the difficulties of finding reinforcements for the forces abroad. The thumbnail sketches of various politicians and soldiers of the day are among the best things

in the Memoirs. Neither Mr. Lloyd George nor Mr. Churchill escape; but the *bête noire* of the author is clearly Mr. Birrell, Secretary for Ireland.

Then, in August, 1918, Sir Nevil was transferred to the control of the Metropolitan Police Force which was lapsing into a state of thinly-veiled insubordination. His work at Scotland Yard in pacifying this serious discontent was successful, while the impression that he left behind him has lasted to this day. The writer may be justly proud of his work, and he also makes this clear to the reader.

In March, 1920, Sir Nevil was sent to Ireland as C-in-C. The light shed by the author on the character and methods of those members of H.M. Government and of the leaders of Sinn Féin, with whom he came into contact, is considerable. His description of the difficulties which beset the Higher Command in Ireland, both of the military and police in their task of suppressing sedition and disorder, form the most interesting and instructive part of his memoirs. The reluctance of the politicians to consent to measures of repression, which they feared would prejudice a solution of the Irish question "by consent," in addition to the conditions described on pages 533-35, exposed the Crown Forces to a trial of endurance of well-nigh intolerable severity. Nevertheless, some readers may hesitate to accept all the author's interpretations of events in Ireland and to adopt all his conclusions as original. Neither do our limits permit a full discussion of several points on which many of those who served His Majesty in Ireland will not see eye to eye with the author.

He also passes a severe criticism on the attitude of the Irish Loyalists, and forgets to draw attention to the number of Loyalists who, if not actually serving in the Crown Forces themselves, had relations so serving. Space will not permit of a full appreciation of the dangerous conditions under which the Loyalists were living. Cases where direct or indirect assistance was lent to the Crown Forces could not be made public and could not be reported in writing to superior authority without risk, except where such assistance had already resulted in tragedy.

It is difficult to avoid the impression that the author, in his anxiety to uphold the splendid reputation of the Army throughout these troubles, runs the risk of going to the opposite extreme in respect of his comrades in arms of the Royal Irish Constabulary, whose death-knell as a force was sounded by the weakness of the Administration of Ireland during the years that preceded the Great War.

These most readable memoirs should be studied by every officer of His Majesty's Forces who may one day find himself employed in any of those positions which stand on the wide and ill-defined borderland between the military and the civil spheres of action. Sir Nevil Macready is inclined to occupy a central and rather personal position on the stage throughout his story—this may be rather an inherited trait—but it is readily pardoned in view of the considerable volume of fresh matter that he provides. The reader is left wondering whether the author has not suppressed a good deal that might have been added to the book; and in many ways this seems a pity.

Memories of Forty-eight Years' Service. By GENERAL SIR HORACE SMITH-DORRIEN, G.C.B., G.C.M.G., D.S.O. (John Murray.)

General Sir Horace Smith-Dorrien is a veritable modern *Cœur-de-Lion*; his military wanderings and adventures could hardly be rivalled; the countries and places to which his service led him read like a gazetteer of empire; the scenes of

action in which he has figured comprise almost the entire history of the British Army during the last half-century; the personalities with whom he came into contact would nearly constitute a military "Who's Who" of the world. His travels, too, have been marked by trials and tribulations, for if the gods showed him especial, and indeed extraordinary, favour throughout his earlier career, it was but to reserve the element of misfortune for his late years.

From January, 1877, when he joined the 95th at Cork the rapid swirling current of his life-story sweeps on with never-flagging interest. First through the tragic day of Isandhlwana, of which Sir Horace was one of the few survivors, and on to Ulundi and the overthrow of Cetywayo. Next we follow him to Egypt, where he takes part in the suppression of Arabi's revolt. A first spell of service in India is followed by an emergency transfer to the Egyptian Army in order to participate in the Nile and Suakim Expeditions. The Staff College and a return to India for the Tirah campaign is sandwiched in before another turn in Egypt to serve under Kitchener in the crushing of the Mahdi at Omdurman.

Whether by luck or inspiration, wherever history is being made, Smith-Dorrien is at hand—he is present at the critical episode of Fashoda, and is able to shed fresh light on Kitchener's meeting with Marchand. A brief sojourn in Malta, and then the South African War breaks out, which fills nearly a third of the book. In this part the author's frank criticism, not the least being that passed on his divisional commander, stands out in strong contrast to his reticence respecting the Great War. Landing in South Africa as a battalion commander, he quits it 16 months later as a Major-General, to take up the important post of Adjutant-General in India. His sidelights on the origins of the Kitchener-Curzon controversy, and on the characters of the protagonists, are an important contribution to history. Rapid promotion brings him to the Aldershot Command in 1907 where for some years, and again later in the Southern Command, he takes a foremost part in forging the superb weapon of 1914. He tells in striking fashion the story of his reforms at Aldershot, his policy of trusting the men and of improving their living conditions. By these means he raised their self-respect and reduced crime, thereby winning for himself a devotion that was to be an incalculable asset in the Retreat from Mons.

It is to this historic event that the general reader will turn most eagerly; yet, if he expects to find a spirited refutation of the criticisms in the Earl of Ypres's "1914," he will be disappointed. Sir Horace, with a restraint that becomes him, attempts no counter-thrusts, content simply to give a narrative of facts during this critical time and to supplement the official history which has already vindicated him. Reading between the lines of his account, it is possible to glean an impression of a lack of orders, of an abandonment of control, and of an abrupt alternation of excessive optimism and pessimism in higher quarters; but the author neither emphasises these factors nor makes them the ground of any retort. He had no need to do so, for, beyond the Official History there is the verdict of the enemy, of von Kluck himself: "The way the retreat was carried out was remarkable. I tried very hard to outflank them, but I could not do so. If I had succeeded the war would have been won." The moral effect of Le Cateau and of the conduct of the British Regular soldier in the Retreat are portrayed in a few vivid sentences that even literary genius could not surpass: "I likened it at the time to a crowd coming away from a race meeting. It was a wonderful sight—men smoking their pipes, apparently quite unconcerned, and walking steadily down the road—no formation of any sort, and men of all units mixed together. The curious thing was that the enemy made no attempt to follow. They respectfully kept their distance behind the rearguards. . . ."

He had saved the British Army, and perhaps Europe; he had earned the

recognition of the world and, at the time, of his own superior; yet fortune was at last to turn her back on him. His star waned in darkness and disappointment. Driven by repeated slights to resign his command in France, illness robbed him of his chance to win fresh laurels in East Africa. But, however cruel the spite of fortune, he leaves a name "fast anchored in the deep abyss of time."

Captains and Kings. By ANDRÉ MAUROIS. Translated by J. LEWIS MAY.
(The Bodley Head.)

M. André Maurois is the gifted and versatile author of "The Silences of Colonel Bramble"; he needs no introduction. This latest volume of his contains something reminiscent of that earlier masterpiece, though the form is different and the method more direct.

The book consists of "Three Dialogues on Leadership"; the characters are "Monsieur R—, Professor of Philosophy in a Paris *lycée*, and Lieutenant C— of the 7th Dragoons, commanding the military post of Bou Salah"; the scene is laid in and around Paris of to-day.

Dialogue the First introduces the soldier and quondam pupil calling on his master. With commendable expedition the argument begins; it is the philosopher who opens an ingenuous and not unfamiliar theme, viz., that "Military Genius is but a fond illusion of nervous civilians, and that a mere baby could take in the laws of strategy." Suspicion that the author intends to load the dice is soon dispelled: the soldier replies brilliantly, while the philosopher soon proves that he is no fool. The argument proceeds to a definition of leadership; the philosopher elaborates his theme that war is at best a peculiarly inexact science in which chance must play a large part; and that the steady plodder, the careful planner, the man innocent of inspiration, is the man most likely to succeed. He asks: "Was it Weygand who brought about the Polish victory, or did the Polish victory produce Weygand?" Though the philosopher's case is well argued, the soldier, in this first dialogue, is more vividly convincing.

In the second dialogue the problem becomes more complex: "Is the genius of the man of action based on logic and exact calculation, or is it the outcome of individual passion?" In the last dialogue the theme is still more weighty: "Are great leaders necessary and good?" This, in other words and in another sphere, lies at the root of the present position of Mussolini.

The two viewpoints and the two personalities are well presented; and, in preserving every touch of light and shade, Mr. Lewis May has given us a brilliant translation. Not a word jars. The philosopher, with logical scepticism and inability to escape from the materialism of science, is mistrustful of authority—preferring, as he expresses it, "many-headed mediocrity." This is a hit at the doctrine of a trained General Staff. The soldier, a character of faith, believes in the inspiration of leadership, weighs his ideas in the scales of military history, regards warfare as an art rather than a science, and does not despair of chivalry. As the philosopher put it: "You are an aristocrat, as I am a Radical, by temperament and by taste." The philosopher effectively attacks the theory of "intuition," to draw from the soldier the retort that "the secret of intuition is passionate attention"; and, later, from the philosopher comes a definition of genius which carries us further than "the infinite capacity for taking pains." Indeed, the book is filled with good things of the same kind, and if any criticism is to be offered it must complain more of a virtue than a fault. At times the argument tends to vanish behind the vivid and very human presentation of these two skilfully portrayed characters.

Some Aspects of Imperial Communications. By MAJOR A. V. T. WAKELY, M.C. (Sifton Praed.)

Major Wakely has produced a book which deals in concise form and in simple terms with what may be termed "the living links of Empire." The subject of Imperial Communications is of interest, not only to the student of war, but should form part of the education of every member of the great Commonwealth of British peoples.

In his first chapter the writer emphasises the supreme importance of these communications by showing that they are vital to Empire co-operation, and that such co-operation is essential, not merely from sentimental reasons nor even for defence purposes, but for the bare needs of existence, and that it is these which make the Mother Country and the Dominions so interdependent.

He sketches for us in bold outlines the essential features of our sea-borne commerce, and two useful maps show the in-flowing and out-flowing streams, great arteries bearing our imports and exports across the map of the world. The various types of sea-carriers, shipping organisation, the scope and limitation of ports, docks and warehouses, are touched on sufficiently to stimulate interest and introduce to the reader the importance of these technical matters.

The chapters on sea communications is a little academical in its insistence on text-book principles and, in dealing with the work of the Navy, there is a tendency to generalise rather than to propound clearly the functions of that Service and how they are to be carried out. Although, too, the broad principles enunciated are sound enough, the author seems to stray from his subject occasionally in endeavouring to apply the maxims of Field Service Regulations to naval strategy. In dealing with the need for fleet bases and for Singapore, as an important example, the distinction between repair bases necessary for the upkeep of the fleet, and operation bases used as "jumping-off" places for actual operations, is not made very clearly, and the non-professional reader might be left with the impression that "temporary bases" are in some measure a substitute for "main bases," whereas, of course, operation bases must have a repair base in support.

On the other hand, we are given an admirable outline of the methods of controlling shipping in war, and some of the principal advantages and disadvantages of the convoy system.

Air Communications are dealt with in a form to stimulate the imagination as to developments in the near future. Railways, inland waterways, mechanical transport, sea and land cables and wireless, all come in for their share of attention. The book is written in clear and simple language, and the essentials of the subject are compressed into a few words. The diagrams and maps are good and equally clear. It can be confidently recommended to officers of all the Services who wish to study the wider aspects of Imperial security and some of the most important objects for which the Navy, Army and Air Force exist.

The Military Side of Japanese Life. By CAPTAIN M. D. KENNEDY.
(Messrs. Constable & Co., Ltd.)

Captain Kennedy, having been seriously wounded in the early part of the Great War, was sent to Japan as a language officer in 1917. He remained there for three years, returned in 1920, ultimately retired and later paid another visit to Japan in a civilian capacity. His expeditions from Japan include visits to Siberia, North Manchuria, Korea and North China. The book he has written is thus founded upon extensive first-hand knowledge and vivid impressions, that he seems to have religiously written down in a diary.

His intention is to give a description of the "human side" of the Japanese Army in the form of a "personal record" of his experiences while attached to various Japanese regiments and institutions. No pretence is made at a "serious study." In this record the reader will find stories of innumerable incidents from which he may draw a mental picture of military life in Japan. In the concluding remarks, the author sums up the main characteristics of Japanese military policy, which may here be quoted: "Insistence on uniformity of training; discouragement of too much competition and of individuality; encouragement of thrift and simple living; importance attached to the training of *morale*, loyalty, and discipline; the teaching that, in war-time, self-destruction is better than surrender; the teaching of reticence in regard to matters of military importance."

The author is full of praise not only for the Japanese officers, who received him everywhere with genuine hospitality, but also for the Japanese of all classes with whom he came in contact in his many sojournings. So much is that so, that he seems to have imbibed the Japanese spirit to the extent of losing the balance of mind that is needed by an impartial critic. He speaks of criticising freely, but the marked reserve with which any adverse criticism is offered and the undoubted fear of being accused of unfriendliness, cannot fail to attract the attention of the most casual reader. Criticism will, therefore, centre not so much on what he has said, but on what he has slurred over or omitted. This must particularly apply to his exposition of Japan's foreign relations. The disjointed method of arranging the book is admitted by the author in his preface, and may somewhat prejudice his readers; but the book will certainly please the Japanese, and should interest those wishing to read the impressions of the Japanese upon a British officer.

The Origins of the War of 1870. New Documents from the German Archives.
By PROFESSOR R. H. LORD. Harvard Historical Studies. (Harvard University Press, 1924.)

Although the French official publication on the origins of the 1870 war has only reached the end of the year 1866, the Paris side of the history of the critical days from 3rd-15th July, 1870, is well established. The German archives have now been opened for research work; and, with the aid of the documents found there, nearly all unpublished hitherto, Professor Lord's book examines in detail the German side of the crisis. A study of this book will convince most readers that in July, 1870, the Governments of both nations were playing with fire, and it is difficult to avoid the conclusion that the French Ministers, by their final unwise demand, went far towards dragging their country into war. One of the most dramatic chapters in the book deals with the happenings at Ems on the fateful 13th July, and with the Ems telegram. It is shown that the famous telegram must have been actually written over an hour before the time which has so far been accepted. Bismarck's revised version of the telegram was a masterly piece of editorial work. He added nothing, he changed scarcely a word; yet it, shortened by half and much simplified, had its spirit and sense quite altered. Moltke promptly said, "If I only live to lead our armies in such a war, then afterwards the devil may take 'the old carcass.'" The die was cast, a conflict became inevitable, and on the 19th July the French declaration of war reached Berlin.

All serious students of 1870 will welcome this interesting and well-written study with its wealth of documents,

A Naval Scrap-Book, 1877-1900. By ADMIRAL SIR REGINALD BACON, K.C.B., K.C.V.O., D.S.O. (Hutchinson.)

The chief interest of these memoirs lies in the fact that the author knew the "Old Navy" in its final period of almost incredible ineptitude, and worked in the development of the "New Navy." Its growth from a score or so of antiquated vessels, officered by men whose ideas of naval warfare had scarcely advanced from the days of sailing ships, to the fleet of scientific machinery of the 1914-18 war, affords, to such a clear-sighted eye-witness and keen participator, material for a most interesting work.

Though some of the tales which are interspersed through the pages are admittedly chestnuts to the Naval man, they may serve to illumine a state of mind or phase of thought of a particular person or period.

This volume deals with Admiral Bacon's career from childhood to the time when Sir John Fisher's flagship, the "Renown," joined the Mediterranean Station, where the author was serving in the "Empress of India." The drawing up of a programme for torpedo-boat manœuvres brought him to the notice of Sir John, who with his genius for collecting round him the most advanced brains of the Service, promptly seized upon him and kept him hard at work on Fleet and torpedo-boat manœuvres and on preparations for war, until promotion removed the author from the Station.

Sir Reginald Bacon has a profound admiration for Admiral Fisher, regarding him as "a cross between a whirlwind and a wizard" in his methods, and as the master-mind that brought the technical efficiency of the Navy up to date; the two other factors which were instrumental in the rejuvenation of the Service were, he considers, the Naval Defence Act, which gave the required impetus to naval construction, and the publication of Mahan's "The Influence of Sea Power upon History," which started the general study of naval strategy. Between these, the essential link, stands Fisher. We hear little of him in this volume; but when the author produces the next, we shall doubtless be shown the whirlwind wizard at work.

Of the many personal experiences which Admiral Bacon recounts, the Benin Expedition is perhaps the most strange and adventurous; many others are interesting and amusing.

Regarded as a Prologue or Introduction to a future work on the development of the New Navy, this volume fulfills the purpose of agreeably whetting the appetite. It is difficult to realise that, twenty-five years before the declaration of the 1914-18 war, we had so small and so *effete* a Navy. Three of the ships mentioned in this book, and forming part of the Channel Fleet of 1889 [which consisted of "Northumberland," "Agincourt," "Monarch," "Iron Duke," and a torpedo-sloop!], are depicted on the frontispiece of this JOURNAL.

The History of the 62nd (West Riding) Division, 1914-1919. By EVERARD WYRALL. Vol. I. (The Bodley Head.)

The infantry of the 62nd Division was originally composed of second-line Territorial battalions of the West Yorkshire, Duke of Wellington's, King's Own Yorkshire Light Infantry, and York and Lancaster Regiment. It was a formation of marked characteristics, and, as it did not go on active service till the beginning of 1917, the writing of its history presents an attractive and not too onerous a task. This volume includes the experiences of the 62nd Division in following up the German retreat to the Hindenburg Line; in the fights for Bullecourt during April and May, 1917; round Cambrai at the end of the year;

in the German offensive of March, 1918; and during the interesting operations on the Ardre, where the 62nd was one of the British divisions which took part in the French counter-stroke of July.

It is evident that Mr. Wyrall is more successful with a divisional than he is with a regimental history. In this case he has achieved a very interesting record based on a diligent study of the official documents, and enriched by the quotation of many personal experiences. There are ample descriptions of all major operations in which the Division had a part. Lastly, a genuine endeavour has been made to do justice to the artillery, engineers, and other arms whose achievements are always liable to be obscured by the fighting prowess of the infantry.

Mr. Wyrall does not reproduce operation orders, but trusts to a concise explanation of the tasks entrusted to the brigades and battalions. This method benefits the continuity of the narrative; moreover, a divisional history cannot afford to overburden itself with technicalities, even in the form of appendices. But it is regrettable that movements of troops and objectives should be indicated by map co-ordinates to which no clue is provided. Little is said concerning the inner life of the Division—of the little diversions and happenings recalled with such pleasure and interest by those who served with it. Perhaps the necessary material is a little difficult to gather, or generally considered as of secondary importance.

A Short Account of the Russo-Japanese War. By "FOOTSLOGGER."
(Forster, Groom & Co.)

This little book sets out to assist officers in their preparation for promotion examinations; and although it can be thoroughly recommended as a very useful aid, the author himself could hardly claim that it is by itself adequate for that purpose.

His method of treating the subject is in some respects novel, for the book consists of an Introduction and five chapters, each giving a summary of a particular period, and concluding with comments based on the principles of war set out in Field Service Regulations and Infantry Training. These comments, as far as they go, are good. The maps are also good, but it would facilitate easy reference if they were placed at the end of the chapters concerned and unfolded clear of the text.

One of the most useful parts of the book is the series of questions contained at the beginning; all of these are of the right type, while references are given at the end of the book to those portions of the text where the answers will be found. The text, however, does not give sufficient material to provide answers which will satisfy examiners, nor can it be said to provide instruction of real value to regimental officers.

The Early History of the Coldstream Guards. By G. DAVIES. (Oxford: The Clarendon Press, 1924.)

The discovery in the Library of Worcester College, Oxford, of the Clark Papers relating to the Civil War was a matter of military importance which might long have remained without due recognition but for the fortunate fact that their custodian, Mr. C. H. Wilkinson, M.C., had served in the Coldstream Guards during the Great War. On his return to Oxford, a quickened interest in his regiment led him to return to the papers, where he discovered much fresh matter dealing with the early days of this one surviving unit of the New Model Army. It was worthy of skilful handling, and Mr. Godfrey Davies has done his work well. In every paragraph there is evidence of exhaustive research, while

the pleasant style of narration makes the long-dead days live again. The reader will derive impressions of the Army life of the period as valuable and intimate as those which Pepys himself has perpetuated of other circles. Sir William Clark was Military Secretary to the Army Council of England prior to 1651 and Secretary to the Commanders-in-Chief in Scotland from 1651 to 1660. Consequently, correspondence of much human interest passed through his hands. Proceedings of Courts-Martial; correspondence concerning Commissions; minutes of the Army Council illustrating its quarrels with the civil Government; matters of discipline in general; together with a host of other details of a personal nature were, of necessity, treated by him. But though the present extracts bear chiefly upon the part played by Monck's regiment in the war, they throw a flood of fresh light both on the drama of the Commonwealth and on some of the chief actors therein.

The two outstanding legacies which the dominant personality of Cromwell left to the British Army were Discipline and Regimental Pride—and who will deny that the one surviving regiment of the "New Model" is the incarnation of both? The correspondence of George Monck, first Colonel of the Coldstreamers, tells us little about his own regiment. "The General was dark, and chewed his tobacco," sums up wonderfully well, in his Chaplain's words, his attitude towards the world at large; but his attitude towards his men may be gathered from three precepts, set down in his "Observations upon Military and Political Affairs" (1645). The first is "That the greatest virtue required in a Souldier is Obedience"; the second emphasises the importance of taking proper care of the troops; while the third states "That it is requisite . . . to mingle love with the severity of Discipline."

REGIMENTAL HISTORIES.

Britain's Sea Soldiers. Vol. II. By Colonel G. Field, R.M.L.I. (The Lyceum Press.)

In the second volume of "Britain's Sea Soldiers," Colonel Field continues and concludes his series of "tableaux" of the history of the Royal Marines. The book deals with nearly every British campaign of the 19th century—of course, from the Marine standpoint. A list of them would be merely tedious; let the reader turn to Appendix F, thirty closely-printed pages of the chronological list of the war and other services of the Royal Marine Corps. The historical value of this record is greatly increased by the plates in colour and half-tone, and especially by the illustrations set in the text.

Although, naturally and rightly, a strong note of pride in the deeds of his Corps runs through the story, the author makes the narrative do its work almost without comment. To the reviewer, both volumes are as full of morals as "Sandford and Merton" or "The Fairchild Family." Lessons strategical and tactical, and of the constitution of the Corps, call for comment on almost every page. A critical analysis of the meaning of so much of the work of the Marines is needed to give their record its full value.

The whole of Chapter XXXIV., "Royal Marines Afloat in the 19th Century," for instance, is a striking example of how, by blindness to the true functions of the Corps, its value to the Navy and to the Nation had diminished, to our cost in the Great War.

The Marines were no longer fully sea-soldiers; rather had they become soldier-seamen. As soldier-seamen they were invaluable—they were essential to the fighting efficiency of every ship in which they served: so they were wanted

in the ships and there were all too few of them for those borderline operations, half sea, half land, which abound in the history of the Marines. What is worse, it had almost been forgotten that such operations were no small part of the work of the Navy. Like the thread in the Cretan maze, there runs through the history of the Marines the paradox that the business of the Navy in war is not only on or under or over the great waters, but that it touches the land at many points. The other moral is that the Marine is only a Marine, as the British Navy understands it, by virtue of his service in the Fleet. The precision and discipline of the Marine's training is only brought to full flower by contact with reality, the sea. The two morals are inseparable, and it may be that both are now given their full weight in the counsels of the Admiralty.

In conclusion, Colonel Field and all associated with him in the production of this history of the Royal Marines are to be congratulated on a work which is fascinatingly interesting as a record of duty faithfully carried out *per mare per terram*.

The History of the Norfolk Regiment. Vol. II. By F. LORAIN PETRE, O.B.E. (Jarrold and Sons, Limited.)

The first volume of the history of this Regiment has already been reviewed in this *Journal*.

Mr. Loraine Petre does not appear to have been specially fortunate in securing first-hand material, such as letters and diaries, for his book, and the record, even if it be as full as it has been possible to make it, is drawn mainly from official diaries, in themselves rather soulless documents. In all, some eight battalions of the Norfolk Regiment saw service in the field: the first in France, Flanders and Italy; the second in Mesopotamia, where it had the dire misfortune of being involved in the defence of and surrender at Kut; the two Territorial battalions served in the same brigade in Gallipoli, Egypt and Palestine; three Service battalions were employed wholly on the Western Front; while the 12th Yeomanry Battalion was in Gallipoli, Egypt, Palestine and France. Ample justice is also done to the work of those battalions which did good service behind the front in the provision of and training of drafts; and the whole record will certainly satisfy the Regiment which is, after all, the main, if not indeed the sole, purpose of such a history.

The work contains a large number of battle sketches in the text; many illustrations, the majority of which appear, however, to possess an interest rather earlier than belongs to the matters dealt with in this volume; there are also several appendices elucidating matters of regimental tradition, questions of uniform and badges.

A Brief History of the Royal Tank Corps. By F. G. WOOLNOUGH, L.C.P. Aldershot: (Gale and Polden. 1925.)

This little book has been produced with the avowed intention of instructing recruits in Regimental History. From this particular point of view, it is doubtless adequate to its purpose. Nevertheless, in these days of mechanicalised warfare, the military world at large takes such a lively interest in the history and development of this engine of war, that it is to be hoped that the Corps will be able, at some future date, to make fuller use of the abundant material which is here compressed into forty pages by a wonderful effort of condensation. The pioneer rarely gets the honour which is his due. Wherefore, even if the lumbering monsters which went into action on 14th September, 1916, did not fulfill all the high expectations placed in them, it should not be forgotten that the men who

took them into battle inaugurated a new phase of warfare by which their successors were to profit.

The records of the actions in which the Corps took part, of the high proportionate casualties which it suffered, and of the honours which it gained, all emphasise the fact that there is room for a far more ample record of the Tank Corps. Though matters of detail may be familiar enough to Tankmen themselves, those outside the Corps would like to hear more of methods employed and of difficulties overcome. If such a story can be published without breach of confidence, it will be welcome. This present edition of the book is rather marred by correction slips.

The Official History of the New Zealand Rifle Brigade. Compiled by LIEUT.-COLONEL W. S. AUSTIN, D.S.O. (L. T. Watkins, Ltd., Wellington, New Zealand.)

This comprehensive history of a distinguished New Zealand unit is no inconsiderable contribution to the military records of the Dominion, for the New Zealand Rifle Brigade took the field in France four battalions strong as a brigade in being. This was in April, 1916, more than a year after the formation of the first two battalions which reached Egypt in November, 1915. The 1st Battalion saw its first service in the Senussi campaign, when the 2nd were employed on the lines of communication.

As an integral part of the New Zealand Division, the Brigade has, of course, a fine record of service on the Western Front from 1916 onward. Colonel Austin is a very faithful chronicler, not only of the bigger actions—the storming of Le Quesnoy on 4th November, 1918, is particularly well told—but also of trench warfare experiences and raiding exploits. Operation orders are given in full, and a consistent endeavour is made to explain the aims and objects of the Higher Command. The appendices are many and various; they include a short account of the 3rd Field Ambulance, which was attached to the Brigade throughout its career in France; a narrative of the Training Battalion in England; and a list of the fallen.

An historical note on the Rifle Brigade (our old 95th), adapted with acknowledgments from Captain H. G. Parkyn's book, is doubtless included in compliment to the Earl of Liverpool, the Colonel of the Regiment. The volume is profusely illustrated, and there are a number of general maps.

OFFICIAL HISTORY OF THE WAR.—VOL. III.

A preliminary draft of the first six chapters of Volume III., dealing with the events on the Western Front, December, 1914–March, 1915, to the end of the Battle of Neuve Chapelle, has been prepared in typescript. It has already been seen by a number of the principal officers who took part, but it has not been possible to get into communication with all and obtain their views as to its general accuracy and completeness.

The compiler will be glad to send the typescript on loan to any officer who was present, for remarks and additions.

Application should be made to

The Director,

Historical Section (Military Branch),

Committee of Imperial Defence,

Auditt House, Victoria Embankment,

London, E.C. 4.

On the typescript can be seen at that address.

PRINCIPAL ADDITIONS TO THE LIBRARY.

January, February, March and April, 1925.

- ON THE ROAD WITH WELLINGTON. By A. L. F. Schaumann. Edited and translated by A. M. Ludovici. 25s. 8vo. London, 1924.
- AIR POWER AND WAR RIGHTS. By J. M. Spaight. 25s. 8vo. (Longmans, Green & Co.) London, 1924. (Presented by the Author.)
- THE JUTLAND SCANDAL. By Admiral Sir R. Bacon, K.C.B., K.C.V.O., D.S.O. 5s. 8vo. London, 1925.
- MARTIAL LAW FROM THE SOLDIERS' POINT OF VIEW. By Major-General Sir S. W. Hare, K.C.M.G., C.B. 1s. 8vo. (W. Clowes & Sons, Ltd.) London, 1924. (Presented by the Author.)
- GENERAL SIR JOHN COWANS, G.C.B., G.C.M.G. By Major D. Chapman-Huston and Major O. Rutter. 2 vols. 42s. 8vo. London, 1924.
- MYSTERIES OF THE SEA. By J. G. Lockhart. 8s. 6d. 8vo. London, 1924.
- THROUGH THIRTY YEARS, 1892-1922. By H. W. Steed. 2 vols. 32s. 8vo. London, 1924.
- MEMOIRS OF PRINCE EUGENE OF SAVOY. Written by Himself. 8vo. London, 1811. (Presented by Captain Sir H. N. Jackson, Bart.)
- ROBERT BLAKE, ADMIRAL AND GENERAL AT SEA. Based on Family and State Papers. By W. H. Dixon. 8vo. London, 1885. (Presented by Captain Sir H. N. Jackson, Bart.)
- THE IMMORTAL SALIENT. AN HISTORICAL RECORD AND COMPLETE GUIDE FOR PILGRIMS TO YPRES. Compiled by Lieut.-General Sir W. Pulteney, K.C.B., K.C.M.G., K.C.V.O., etc., and B. Brice. 8vo. (J. Murray.) (For the Ypres League). 1924. (Presented by Lieut.-General Sir W. Pulteney, K.C.B., etc.)
- LES FLOTTES DE COMBAT POUR 1925. Par le Commandant De Balincourt. Illustrations. 8vo. Paris, 1925. (Presented by the Publishers.)
- THE RESOURCES OF THE EMPIRE SERIES. Communications. By W. T. Stephenson. 21s. 8vo. London, 1924.
- THE WAR OF LOST OPPORTUNITIES. By General Von Hoffman. 12s. 6d. 8vo. London, 1924.
- A SHORT ACCOUNT OF THE RUSSO-JAPANESE WAR FOR EXAMINATION PURPOSES. By "Footslogger." With Foreword by General Sir H. Smith-Dorrien, G.C.B., G.C.M.G., D.S.O. Maps. 8vo. (Forster, Groom & Co., Ltd.) London, 1925. (Presented by the Author.)

- LE SERVICE DE RENSEIGNEMENTS EN CAMPAGNE. Par Lieut.-Colonel Paquet. 8vo. Paris, 1924. (Presented by the Publishers.)
- LE MODERNISME AMÉRICAIN. Par Colonel G. Becker. 8vo. Paris, 1924. (Presented by the Publishers.)
- STABLE MANAGEMENT AND EXERCISE. By Captain M. H. Hayes. 12s. 8vo. London, 1909.
- THE COMPLETE HORSEMAN. By W. S. Dixon. 15s. 8vo. London, 1922.
- AN ENSIGN OF THE 19TH FOOT. By C. Reith. A Novel of Empire. 7s. 6d. 8vo. (Heath, Cranton, Ltd.) 1925. (Presented by the Publishers.)
- L'AVÈNEMENT DES ARMES AUTOMATIQUES. Par Marcel Devouges. 8vo. Paris, 1925. (Presented by the Publishers.)
- FRENCH HEADQUARTERS. By J. de Pierrefeu. 10s. 6d. 8vo. London, 1925.
- WIRELESS POSSIBILITIES. By Professor A. W. Low. 2s. 6d. 8vo. London, 1924.
- HORSE-SENSE AND HORSEMANSHIP OF TO-DAY. By Lieut.-Colonel G. Brooke, D.S.O., M.C. 15s. 8vo. London, 1924.
- THE HODSOCK BALLISTIC TABLES FOR RIFLES. By F. W. Jones, O.B.E. 10s. 6d. 8vo. (Edward Arnold & Co.) 1925. (Presented by the Publishers.)
- THE CHALLENGE OF ASIA. By S. Rice. 7s. 6d. 8vo. London, 1925.
- THE CLASH OF COLOUR. By B. Mathews. 2s. 8vo. London, 1925.
- THE WAR BOOK OF GRAY'S INN. Compiled by the Masters of the Bench for the Information of Members of the House Now and Hereafter. Illustrations. 8vo. (Butterworth & Co.) 1921. (Presented by Lieut.-Colonel His Honour Judge J. Bowen, K.C.)
- LES "ENGINS D'ACCOMPAGNEMENT" EN FRANCE ET À L'ÉTRANGER. Par Commandant Biswang. 8vo. (Berger-Lévrault.) Paris, 1925. (Presented by the Publishers.)
- AUFMARSCH NACH ZWEI FRONTEN. Auf Grund der Operationspläne von 1871-1914. General der Infanterie H. Von Staabs. 8vo. (E. S. Mittler und Sohn.) Berlin, 1925. (Presented by the Publishers.)
- HISTORY OF THE GREAT WAR. BASED ON OFFICIAL DOCUMENTS. MILITARY OPERATIONS, FRANCE AND BELGIUM, 1914. Volume II. By Brig.-General J. E. Edmonds, C.B., C.M.G. 12s. 6d. 8vo. (MacMillan & Co.) London, 1925. Separate case with 40 Maps to above History. Price 5s. 6d. (Presented by the Publishers.)
- CAPTAINS AND KINGS. By A. Maurois. Translated by J. L. May. 5s. 8vo. (John Lane, The Bodley Head, Ltd.) London. (Presented by the Publishers.)
- GENERAL BRAMBLE. By A. Maurois. 6s. 8vo. London, 1924.
- MILITARY GEOGRAPHY OF THE BRITISH COMMONWEALTH. By Major A. E. W. Salt. 10s. 8vo. (Gale & Polden.) Aldershot, 1925. (Presented by the Publishers.)
- THE REGIMENTAL ANNUAL. THE SHERWOOD FORESTERS, NOTTS AND DERBY REGIMENT, 1924. Edited by Colonel H. C. Wylly, C.B. 8vo. (G. Allen & Unwin, Ltd.) London, 1925. (Presented by the Editor.)

- MEMOIRS OF A NAPOLEONIC OFFICER. By J. B. Barres. 12s. 6d. 8vo. London, 1925.
- AIRCRAFT OF THE WORLD. By Major F. A. De V. Robertson. 7s. 6d. 8vo. London, 1925.
- TANNENBERG. By Major-General Sir E. Ironside, K.C.B. 15s. 8vo. London, 1925.
- DISARMO E DIFESA. L. G. Roissard. 8vo. Milano, 1925. (Presented by the Publishers.)
- KING EDWARD VII. A BIOGRAPHY. By Sir S. Lee. Vol. I. £1 11s. 6d. 8vo. London, 1925.
- STRAWS IN THE WIND. By Commander H. G. Stoker, D.S.O., R.N. 10s. 6d. 8vo. London, 1925.
- ECONOMICS OF ROAD TRANSPORT. By K. G. Fenelon, M.A. 10s. 6d. 8vo. London, 1925.
- MEMORIES OF FORTY-EIGHT YEARS' SERVICE. By General Sir H. Smith-Dorrien, G.C.B., G.C.M.G., D.S.O. 25s. 8vo. (J. Murray.) London, 1925. (Presented by the Publishers.)
- THE ENGLISH-SPEAKING NATIONS. A STUDY OF THE DEVELOPMENT OF THE COMMONWEALTH IDEAL. By G. W. Morris, M.A., and L. S. Wood, M.A. Illustrations. 8vo. (The Clarendon Press.) Oxford, 1924. (Presented by the Delegates of the Clarendon Press.)
- ORGANISATION FOR WAR WITHIN AN INFANTRY BATTALION. By Colonel T. N. S. M. Howard, D.S.O. 1s. (Gale & Polden, Ltd.) Aldershot, 1925. (Presented by the Publishers.)
- THE EMPIRE AT WAR. Vol. IV. By Sir C. Lucas, K.C.B., K.C.M.G. 28s. 8vo. London, 1925.
- A NAVAL SCRAP-BOOK. FIRST PART, 1877-1900. By Admiral Sir R. H. Bacon, K.C.B., K.C.V.O., D.S.O. Illustrations. 24s. 8vo. (Hutchinson & Co.) London, 1925. (Presented by the Author.)
- GREAT CIRCLE SAILING LAT. BY ALT. AND HOUR ANGLE. INDIAN NAVY AND EASTERN ROUTES. By J. F. Ruthven. 5s. 8vo. (J. D. Potter.) London, 1925. (Presented by the Publishers.)
- THE ROLL OF HONOUR OF THE INSTITUTION OF ELECTRICAL ENGINEERS, 1914-1919. Illustrations and Maps. Folio. (Unwin Brothers, Ltd.) London, 1925. (Presented by the President and Council of the Institution of Electrical Engineers.)
- LA VÉRITÉ SUR L'ÉVACUATION D'ANVERS EN 1914. Par Major-General E. Menzel. 8vo. Bruges, 1925. (Presented by the Author.)
- THE DRAUGHTS OF THE MOST REMARKABLE FORTIFIED TOWNS OF EUROPE. In 44 copper Plates, with a geographical description of the said places, and the History of the sieges they have sustain'd, and the revolutions they have undergone, for above these two hundred years last. By Mr. Boyer. 8vo. London, 1701. (Presented by Lt.-General Sir H. E. Belfield, K.C.B., K.C.M.G., K.B.E., D.S.O.)

LES TRAVAUX DE MARS OU LA FORTIFICATION NOUVELLE TANT RÉGULIÈRE QU'IRRÉGULIÈRE. Par A. M. Mallet. 3 Vols. 8vo. Paris, 1672. (Presented by A. Laws, F.A.I.)

SIR JOHN MOORE'S SYSTEM OF TRAINING. By Colonel J. F. C. Fuller, D.S.O. 10s. 6d. 8vo. (Hutchinson & Co.) London, 1925. (Presented by the Publishers.)

THE TWENTY-THIRD DIVISION, 1914-1919. By Lt.-Colonel H. R. Sandilands, C.M.G., D.S.O. Illustrations and Maps. 30s. 8vo. London, 1925.

REGIMENTAL HISTORIES.

THE WAR HISTORY OF THE 6TH BN. THE SOUTH STAFFORDSHIRE REGIMENT (T.F.). By a Committee of Officers who served with the Battalion. Illustrations. 21s. 8vo. (W. Heinemann, Ltd.) London, 1924. (Presented by the Battalion War History Committee.)

THE HISTORY OF THE NORFOLK REGIMENT, 1685-1918. By F. L. Petre, O.B.E. Vol. II., 4th August, 1914-31st December, 1918. Illustrations and Maps. (Jarrold & Sons, Ltd.) Norwich. (Presented by the Regimental History Committee.)

BRITAIN'S SEA SOLDIERS. A HISTORY OF THE ROYAL MARINES. By Colonel G. Field, R.M.L.I. Vol. II. Illustrations and Plans. 8vo. (The Lyceum Press.) Liverpool, 1924. (Presented by the Committee of Britain's Sea Soldiers' Fund.)

HISTORY OF THE SOMERSET YEOMANRY, VOLUNTEER, AND TERRITORIAL UNITS. By W. G. Fisher. 8vo. Taunton, 1924.

THE EARLY HISTORY OF THE COLDSTREAM GUARDS. By G. Davies. Illustrations. 8vo. (Clarendon Press.) Oxford, 1924. (Presented by the Delegates of the Clarendon Press.)

THE OFFICIAL HISTORY OF THE NEW ZEALAND RIFLE BRIGADE (THE EARL OF LIVERPOOL'S OWN). Compiled by Lieut.-Colonel W. S. Austin, D.S.O. 8vo. (L. T. Watkins, Ltd.) Wellington, 1924. (Presented by the Trustees of the N.Z. Rifle Brigade.)

THE BORDER REGIMENT IN THE GREAT WAR. By Colonel H. C. Wyll, C.B. Illustrations and Maps. 8vo. (Gale & Polden, Ltd.) Aldershot, 1925. (Presented by the Publishers.)

A HISTORY OF THE 26TH PUNJABIS, 1857-1923. Compiled from the Digest of Services and other Office Records. By Lieut.-Colonel P. S. Stoney. 8vo. (Messrs. Gale & Polden.) Aldershot, 1924. (Presented by Lieut.-Colonel P. S. Stoney, Commandant, 2nd/15th Punjab Regiment.)

HISTORY OF THE 1ST D.C.L.I., 1914. By E. M. Channing-Renton. 3s. 10d. 8vo. (Studies Publications.) 1924. (Presented by the Publishers.)

THE 1ST BATTALION THE FAUGH-A-BALLAGHS IN THE GREAT WAR. By Brig.-General A. R. Burrowes, C.M.G., D.S.O. Illustrations and Maps. 8vo. (Gale & Polden, Ltd.) Aldershot, n.d. (Presented by the Author.)

- A SHORT HISTORY OF THE CAMERONIANS (SCOTTISH RIFLES). By Colonel H. C. Wyllie, C.B. 8vo. (Gale & Polden.) Aldershot, 1924. (Presented by Major-General Sir P. R. Robertson, K.C.B., C.M.G., Colonel, The Cameronians, Scottish Rifles.)
- A SHORT HISTORY OF THE ROYAL WELCH FUSILIERS. By Major E. O. Skaife, O.B.E. Illustrations. 3s. 8vo. (Gale & Polden, Ltd.) Aldershot, 1925. (Presented by the Publishers.)
- A SHORT HISTORY OF THE OXFORDSHIRE AND BUCKINGHAMSHIRE LIGHT INFANTRY, 1741-1922. By Lieut.-Colonel R. B. Crosse, D.S.O. 1s. 3d. 8vo. (Gale & Polden, Ltd.) Aldershot, 1925. (Presented by the Publishers.)
- A BRIEF HISTORY OF THE ROYAL TANK CORPS. By F. G. Woolnough, L.C.P. 1s. 6d. 8vo. (Gale & Polden, Ltd.) Aldershot. (Presented by the Publishers.)
- THE HISTORY OF THE KING'S SHROPSHIRE LIGHT INFANTRY IN THE GREAT WAR, 1914-1918. Edited by Major W. De B. Wood. 5s. 8vo. (The Medical Society, Ltd.) London, 1925. (Presented by Major-General R. Reade, C.B., C.M.G., Colonel of The King's Shropshire Light Infantry.)
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Royal United Service Institution.

REPORT OF PROCEEDINGS AT THE NINETY-FOURTH ANNIVERSARY
MEETING HELD ON TUESDAY, 3RD MARCH, 1925, AT 3.30 P.M.

ADMIRAL SIR REGINALD G. O. TUPPER, G.B.E., K.C.B., C.V.O.
(Chairman of the Council), presiding.

THE CHAIRMAN : My Lords and Gentlemen, I call upon the
Secretary to read the Notice convening the Meeting.

THE SECRETARY (Lieut.-Colonel Sir Arthur Leetham, K.C.V.O.,
C.M.G., F.S.A.) read the Notice.

ANNUAL REPORT FOR 1924.

COUNCIL.

The Council regret to report the death of Captain W. F. Caborne, C.B., R.D., R.N.R. He joined the Council in 1900, and served continuously, having been Chairman of the Museum and General Purposes Committee since 1905.

Captain Sir David Wilson Barker, Knt., R.N.R., has been elected a Member of the Council vice the late Captain W. F. Caborne, C.B., R.D., R.N.R.

Rear-Admiral A. G. Hotham, C.B., C.M.G., Director of Naval Intelligence, has been appointed a Member of the Council as the official representative of the Admiralty, vice Rear-Admiral M. S. FitzMaurice, C.B., C.M.G.

(Chapter IV., Para. 9, of the Bye-Laws.)

The following Members of the Council, having completed three years' service, retire :—

Admiral of the Fleet Earl Beatty, G.C.B., O.M., G.C.V.O., D.S.O.

Field-Marshal Sir W. R. Robertson, Bart., G.C.B., G.C.M.G., K.C.V.O., D.S.O.

Admiral Sir R. G. O. Tupper, G.B.E., K.C.B., C.V.O.

General Sir E. G. Barrow, G.C.B., G.C.S.I.

General Lord Horne, G.C.B., K.C.M.G.

Lieutenant-General Sir H. S. G. Miles, G.C.B., G.C.M.G., G.B.E., C.V.O.,

all of whom offer themselves for re-election.

MEMBERSHIP.

The Council beg to report that during the past year 401 officers joined the Institution (against 487 in 1923). There were 157 withdrawals and 103 deaths (of which 43 were Life Members), making an increase on the year of 141. The Council trust that Members will do their utmost to introduce new Members during the current year.

The details of Members joining are as follows :—

Regular Army (all arms)	..	..	..	..	280
Royal Navy	..	..	..	..	39
Royal Air Force	..	..	..	..	35
Territorial Army (including Yeomanry)	..	..	..	..	22
Royal Marines	..	..	..	..	8
Royal Naval Reserve	..	..	..	..	8
Overseas Forces	..	..	..	..	4
Militia	..	..	..	..	3
Civil Functionaries	..	..	..	..	2
Total	..	..	..	..	401

The total number of Members on 31st December was 5,812.

The detailed list of the various Services in which Members on the active list are serving has recently been revised, and records the following :—

Regular Infantry 756, Indian Army 402, Royal Navy 368, Royal Artillery 319, Royal Engineers 192, Royal Air Force 153, Territorial Army 109, Guards 88, Departmental Corps 72, Cavalry 63, Royal Marines 57, Royal Naval Reserve 31, Royal Tank Corps 19, Overseas Forces 19.

A very gratifying feature is the great support which has been received from serving officers of the Indian Army.

FINANCE.

It will be seen by the Annual Accounts that the year's working has given a balance debit of £853 3s. 10d.

The Council have pleasure in reporting that the Institution has been exempted from paying Income Tax under Schedule "A," and it will be seen from the Accounts that a sum of £643 10s. 0d. has been received back in respect of previous payments.

The Quinquennial Assessment Valuation of the City of Westminster takes place in 1925. Every effort will be made by the Council to obtain a reduction in the rating of the Institution.

The invested funds amount to £19,595 8s. 5d., which is the market value on such investments in the Stock Exchange Official Price List, December 31st, 1924, which is an increase on 1923 of £423 17s. 7d.

THE JOURNAL.

The Journal has been published regularly each quarter and, amongst other functions, continues to provide an important medium for broadcasting the Lectures delivered at the Institution to Members who are not able to attend them.

Contributions of much value and interest are being readily proffered by Army Members and other Military writers, and frequent applications are received for copies of the JOURNAL or of specific lectures or articles by serving and other officers.

There is still a regrettable lack of support from the Navy in both lectures and articles; and, with a view to ending any misapprehension that may exist among serving Officers of the attitude of the Admiralty towards the Institution, an extract from a Fleet Order bearing on the subject has been republished at the head of the Naval Notes of the February JOURNAL.

In this it is stated that:—

" Their Lordships desire it to be known that they wish to give every encouragement to Officers to join the Institution and to take part in its Essays, Lectures and Debates."

The Editor is making special efforts to obtain more Naval support for the JOURNAL.

Increasing interest in this feature of the Institution is being shown by the Royal Air Force.

The Institution is specially indebted to the Naval, General and Air Staffs for their assistance in compiling the Naval, Military and Air Force Notes, and to the General Staff (War Office) for permission to reproduce some valuable articles.

The thanks of the Institution are due to the following writers and lecturers for papers contributed and lectures delivered by them:—Captain H. T. Birch-Reynardson; Major-General Sir W. D. Bird, K.B.E., C.B., C.M.G., D.S.O.; Major-General the Hon. Sir Francis R. Bingham, K.C.B., K.C.M.G.; Major G. C. G. Blunt, D.S.O., O.B.E., A.M.I.Mech.E., R.A.S.C.; Lieutenant-Commander G. N. W. Boyes, R.N.; Major R. J. Brett, D.S.O., 43rd Light Infantry; Air Commodore R. H. Clark-Hall, C.M.G., D.S.O., R.A.F.; Captain the Rt. Hon. Viscount Curzon, M.P.; "Dalil"; Wing-Commander C. H. K. Edmonds, D.S.O., O.B.E.; C. Ernest Fayle, Esq.; Colonel J. F. C. Fuller, D.S.O.; Rear-Admiral Sir E. P. F. G. Grant, K.C.V.O., C.B.; B. Heroys, General in the Imperial Russian Army; Admiral Mark Kerr, C.B., M.V.O.; Major-General W. M. St. G. Kirke, C.B., C.M.G., D.S.O., *p.s.c.*; Major-General Sir George MacMunn, K.C.B., K.C.S.I., D.S.O.; Rear-Admiral H. L. Mawbey, C.B., C.V.O.; Captain A. H. Norman, C.M.G., R.N.; Colonel G. M. Orr, C.B.E., D.S.O., Indian Army (Retired); Major T. J. Ponting, 4/8th P.W.O., Punjab Regiment; Colonel Donald E. Robertson, D.S.O., I.A.; Captain C. N. Robinson, R.N.; Major G. H. Scott, C.B.E., A.F.C.; Captain E. W. Sheppard, O.B.E., M.C., Royal Tank Corps; "Skander Bey"; Lieutenant-Commander G. C. Steele, V.C., R.N.; Major C. T. Tones, D.S.O., M.C.; Captain C. V. Osborne, C.M.G., R.N.; Vice-Admiral Sir Richard Webb, K.C.M.G., C.B.; Lieutenant-Colonel P. T. Westmorland, C.M.G., D.S.O.; Captain R. J. Wilkinson, O.B.E., 2nd Bombay Pioneers, Indian Army; and Colonel The Hon. M. A. Wingfield, C.M.G., D.S.O.

There have been changes in the editorship of the JOURNAL during the year. Lieutenant-Commander A. Colquhoun Bell, R.N., having resigned the post in August last, Colonel H. C. Wylly, C.B., the former Editor, kindly undertook to edit the November number.

Since then the Council have appointed Captain E. Altham, C.B., R.N., as Editor, and Lieutenant-Colonel H. G. de Watteville, C.B.E., *p.s.c.*, late R.A., as Assistant Editor (Military).

The outside sales of the JOURNAL during the year under review have amounted to £472 17s. 10d., as compared with £352 18s. 7d. the previous year.

LIBRARY.

The number of books added to the Library during the past year was 325, which includes gifts of works from Brigadier-General W. C. Staveley, C.B., and Captain Sir H. N. Jackson, Bart.

Lieutenant-General Sir A. E. Codrington, K.C.B., K.C.M.G., has presented to the Institution the Embarkation Diary for the British Army upon its evacuation of Balaklava. These, together with the Raglan Papers which were presented last year by Lieutenant-Colonel Lord Raglan, form a very valuable collection of manuscripts connected with the Crimean War. The documents have been placed in the Manuscript Room.

The number of Officers to use the Library in connection with their professional examinations has again increased; in nearly every case a number of duplicate copies of the books which are likely to be in demand for examinations are now in the Library.

The Pamphlet Series, which was commenced with a view to helping Officers working for examinations, has grown considerably and now numbers over 1,000. It has been very largely used.

The number of books in the Library is now 26,072, and maps 7,387.

The number of subscribers to the Lending Library during the past year was 351, compared with 316 in the past year.

The number of works issued on loan to Members was 4,569, as against 3,664 in 1923.

MUSEUM.

During 1924 there have been added 72 new exhibits, all of which have been duly catalogued, recorded in the JOURNAL, and placed on exhibition in the building. The Council desire to express their thanks to the various donors for these valuable additions.

The Council, as a special case, lent a number of exhibits to the Government Section of the British Empire Exhibition, all of which have now been returned, and the thanks of the Army Council and India Office were duly received.

Among the additions are a collection of old and curious horse-bits given by His Majesty The King; a model of a Frigate of 1712 by A. W. Nye, Esq.; collection of interesting old Nautical Instruments given by Captain Brien Money, D.S.O., R.N.; three Squadron Standards of "The Blues" of the period of King George III., by the Viscountess Hill; three pairs of old Colours of the Victoria Rifles, given by the Officers of the 9th London Regiment; and a collection of Royal Engineer Uniform, 1795-1820, by Rear-Admiral E. P. Jervoise.

The total number of persons to pass through the turnstiles amounted to 30,854, against 30,648 in 1923. These figures include a large number of Soldiers, Sailors,

and Boy Scouts, etc., who are granted free admission, but it does not account for the very considerable number of visitors introduced by Members personally. The total amount taken at the turnstile was £1,127 9s. 3d., against £1,184 2s. 6d. in 1923, being a small decrease. The sales of the Museum Catalogue amounted to £98 11s. 9d., which must be considered as satisfactory.

During the year, the 7th edition of the Catalogue was brought out and is now on sale. Thirty-eight Schools were granted free admission to the Museum during the year, and attendants were specially detailed to conduct these parties and explain the various exhibits.

The amount standing to the credit of the Museum Purchase Fund is £30 6s. 2d., and the Museum Committee hope that this fund will continue to receive support from Members, especially those interested in the Museum.

ARTHUR LEETHAM, Lieut.-Colonel,

Secretary and

February 1st, 1925.

Chief Executive Officer.

CR.

REVENUE ACCOUNT FOR THE YEAR ENDING 31st DECEMBER, 1924.

1923.		1922.		1921.		1920.		1919.		1918.		1917.		1916.		1915.		1914.		1913.		1912.		1911.		1910.		1909.		1908.		1907.		1906.		1905.		1904.		1903.		1902.		1901.		1900.		1899.		1898.		1897.		1896.		1895.		1894.		1893.		1892.		1891.		1890.		1889.		1888.		1887.		1886.		1885.		1884.		1883.		1882.		1881.		1880.		1879.		1878.		1877.		1876.		1875.		1874.		1873.		1872.		1871.		1870.		1869.		1868.		1867.		1866.		1865.		1864.		1863.		1862.		1861.		1860.		1859.		1858.		1857.		1856.		1855.		1854.		1853.		1852.		1851.		1850.		1849.		1848.		1847.		1846.		1845.		1844.		1843.		1842.		1841.		1840.		1839.		1838.		1837.		1836.		1835.		1834.		1833.		1832.		1831.		1830.		1829.		1828.		1827.		1826.		1825.		1824.		1823.		1822.		1821.		1820.		1819.		1818.		1817.		1816.		1815.		1814.		1813.		1812.		1811.		1810.		1809.		1808.		1807.		1806.		1805.		1804.		1803.		1802.		1801.		1800.		1799.		1798.		1797.		1796.		1795.		1794.		1793.		1792.		1791.		1790.		1789.		1788.		1787.		1786.		1785.		1784.		1783.		1782.		1781.		1780.		1779.		1778.		1777.		1776.		1775.		1774.		1773.		1772.		1771.		1770.		1769.		1768.		1767.		1766.		1765.		1764.		1763.		1762.		1761.		1760.		1759.		1758.		1757.		1756.		1755.		1754.		1753.		1752.		1751.		1750.		1749.		1748.		1747.		1746.		1745.		1744.		1743.		1742.		1741.		1740.		1739.		1738.		1737.		1736.		1735.		1734.		1733.		1732.		1731.		1730.		1729.		1728.		1727.		1726.		1725.		1724.		1723.		1722.		1721.		1720.		1719.		1718.		1717.		1716.		1715.		1714.		1713.		1712.		1711.		1710.		1709.		1708.		1707.		1706.		1705.		1704.		1703.		1702.		1701.		1700.		1699.		1698.		1697.		1696.		1695.		1694.		1693.		1692.		1691.		1690.		1689.		1688.		1687.		1686.		1685.		1684.		1683.		1682.		1681.		1680.		1679.		1678.		1677.		1676.		1675.		1674.		1673.		1672.		1671.		1670.		1669.		1668.		1667.		1666.		1665.		1664.		1663.		1662.		1661.		1660.		1659.		1658.		1657.		1656.		1655.		1654.		1653.		1652.		1651.		1650.		1649.		1648.		1647.		1646.		1645.		1644.		1643.		1642.		1641.		1640.		1639.		1638.		1637.		1636.		1635.		1634.		1633.		1632.		1631.		1630.		1629.		1628.		1627.		1626.		1625.		1624.		1623.		1622.		1621.		1620.		1619.		1618.		1617.		1616.		1615.		1614.		1613.		1612.		1611.		1610.		1609.		1608.		1607.		1606.		1605.		1604.		1603.		1602.		1601.		1600.		1599.		1598.		1597.		1596.		1595.		1594.		1593.		1592.		1591.		1590.		1589.		1588.		1587.		1586.		1585.		1584.		1583.		1582.		1581.		1580.		1579.		1578.		1577.		1576.		1575.		1574.		1573.		1572.		1571.		1570.		1569.		1568.		1567.		1566.		1565.		1564.		1563.		1562.		1561.		1560.		1559.		1558.		1557.		1556.		1555.		1554.		1553.		1552.		1551.		1550.		1549.		1548.		1547.		1546.		1545.		1544.		1543.		1542.		1541.		1540.		1539.		1538.		1537.		1536.		1535.		1534.		1533.		1532.		1531.		1530.		1529.		1528.		1527.		1526.		1525.		1524.		1523.		1522.		1521.		1520.		1519.		1518.		1517.		1516.		1515.		1514.		1513.		1512.		1511.		1510.		1509.		1508.		1507.		1506.		1505.		1504.		1503.		1502.		1501.		1500.		1499.		1498.		1497.		1496.		1495.		1494.		1493.		1492.		1491.		1490.		1489.		1488.		1487.		1486.		1485.		1484.		1483.		1482.		1481.		1480.		1479.		1478.		1477.		1476.		1475.		1474.		1473.		1472.		1471.		1470.		1469.		1468.		1467.		1466.		1465.		1464.		1463.		1462.		1461.		1460.		1459.		1458.		1457.		1456.		1455.		1454.		1453.		1452.		1451.		1450.		1449.		1448.		1447.		1446.		1445.		1444.		1443.		1442.		1441.		1440.		1439.		1438.		1437.		1436.		1435.		1434.		1433.		1432.		1431.		1430.		1429.		1428.		1427.		1426.		1425.		1424.		1423.		1422.		1421.		1420.		1419.		1418.		1417.		1416.		1415.		1414.		1413.		1412.		1411.		1410.		1409.		1408.		1407.		1406.		1405.		1404.		1403.		1402.		1401.		1400.		1399.		1398.		1397.		1396.		1395.		1394.		1393.		1392.		1391.		1390.		1389.		1388.		1387.		1386.		1385.		1384.		1383.		1382.		1381.		1380.		1379.		1378.		1377.		1376.		1375.		1374.		1373.		1372.		1371.		1370.		1369.		1368.		1367.		1366.		1365.		1364.		1363.		1362.		1361.		1360.		1359.		1358.		1357.		1356.		1355.		1354.		1353.		1352.		1351.		1350.		1349.		1348.		1347.		1346.		1345.		1344.		1343.		1342.		1341.		1340.		1339.		1338.		1337.		1336.		1335.		1334.		1333.		1332.		1331.		1330.		1329.		1328.		1327.		1326.		1325.		1324.		1323.		1322.		1321.		1320.		1319.		1318.		1317.		1316.		1315.		1314.		1313.		1312.		1311.		1310.		1309.		1308.		1307.		1306.		1305.		1304.		1303.		1302.		1301.		1300.		1299.		1298.		1297.		1296.		1295.		1294.		1293.		1292.		1291.		1290.		1289.		1288.		1287.		1286.		1285.		1284.		1283.		1282.		1281.		1280.		1279.		1278.		1277.		1276.		1275.		1274.		1273.		1272.		1271.		1270.		1269.		1268.		1267.		1266.		1265.		1264.		1263.		1262.		1261.		1260.		1259.		1258.		1257.		1256.		1255.		1254.		1253.		1252.		1251.		1250.		1249.		1248.		1247.		1246.		1245.		1244.		1243.		1242.		1241.		1240.		1239.		1238.		1237.		1236.		1235.		1234.		1233.		1232.		1231.		1230.		1229.		1228.		1227.		1226.		1225.		1224.		1223.		1222.		1221.		1220.		1219.		1218.		1217.		1216.		1215.		1214.		1213.		1212.		1211.		1210.		1209.		1208.		1207.		1206.		1205.		1204.		1203.		1202.		1201.		1200.		1199.		1198.		1197.		1196.		1195.		1194.		1193.		1192.		1191.		1190.		1189.		1188.		1187.		1186.		1185.		1184.		1183.		1182.		1181.		1180.		1179.		1178.		1177.		1176.		1175.		1174.		1173.		1172.		1171.		1170.		1169.		1168.		1167.		1166.		1165.		1164.		1163.		1162.		1161.		1160.		1159.		1158.		1157.		1156.		1155.		1154.		1153.		1152.		1151.		1150.		1149.		1148.		1147.		1146.		1145.		1144.		1143.		1142.		1141.		1140.		1139.		1138.		1137.		1136.		1135.		1134.		1133.		1132.		1131.		1130.		1129.		1128.		1127.		1126.		1125.		1124.		1123.		1122.		1121.		1120.		1119.		1118.		1117.		1116.		1115.		1114.		1113.		1112.		1111.		1110.		1109.		1108.		1107.		1106.		1105.		1104.		1103.		1102.		1101.		1100.		1099.		1098.		1097.		1096.		1095.		1094.		1093.		1092.		1091.		1090.		1089.		1088.		1087.		1086.		1085.		1084.		1083.		1082.		1081.		1080.		1079.		1078.		1077.		1076.		1075.		1074.		1073.		1072.		1071.		1070.		1069.		1068.		1067.		1066.		1065.		1064.		1063.		1062.		1061.		1060.		1059.		1058.		1057.		1056.		1055.		1054.		1053.		1052.		1051.		1050.		1049.		1048.		1047.		1046.		1045.		1044.		1043.		1042.		1041.		1040.		1039.		1038.		1037.		1036.		1035.		1034.		1033.		1032.		1031.		1030.		1029.		1028.		1027.		1026.		1025.		1024.		1023.		1022.		1021.		1020.		1019.		1018.		1017.		1016.		1015.		1014.		1013.		1012.		1011.		1010.		1009.		1008.		1007.		1006.		1005.		1004.		1003.		1002.		1001.		1000.		999.		998.		997.		996.		995.		994.		993.		992.		991.		990.		989.		988.		987.		986.		985.		984.		983.		982.		981.		980.		979.		978.		977.		976.		975.		974.		973.		972.		971.		970.		969.		968.		967.		966.		965.		964.		963.		962.		961.		960.		959.		958.		957.		956.		955.		954.		953.		952.		951.		950.		949.		948.		947.		946.		945.		944.		943.		942.		941.		940.		939.		938.		937.		936.		935.		934.		933.		932.		931.		930.		929.		928.		927.		926.		925.		924.		923.		922.		921.		920.		919.		918.		917.		916.		915.		914.		913.		912.		911.		910.		909.		908.		907.		906.		905.		904.		903.		902.		901.		900.		899.		898.		897.		896.		895.		894.		893.		892.		891.		890.		889.		888.		887.		886.		885.		884.		883.			
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CHESNEY MEMORIAL MEDAL FUND.

D.R.	1924.	31st DECEMBER, 1924.		CR.
		£	s. d.	
Jan. 1	To Balance—brought forward	62	18 3	
June 2	" Dividend on £230 Bengal & North Western Railway Co. 34 % Preference Stock	3	10 9	
July 3	" Refund of Income Tax on Dividends 1923-24	1	0 4	
Dec. 2	" Dividend on £230 Bengal & North Western Railway Co. 34 % Preference Stock	3	10 9	
		£71	0 1	
		£71	0 1	

We hereby certify the above Account to be correct,
 611, Fane Street, London, E.C.2.
 23rd January, 1925.

WILDE, FERGUSON-DAVEY, AND MILLER, Chartered Accountants,
 Auditors.

TRENCH GASCOIGNE PRIZE FUND.

D.R.	1924.	31st DECEMBER, 1924.		CR.
		£	s. d.	
Jan. 1	To Balance—brought forward	42	15 8	
" "	" Dividend on £1,802 0s. 0d. London & North Eastern Railway 3 % Debenture Stock	21	12 11	
June 2	" Dividend on £100 0s. 0d. 5 % War Loan, 1923-47,	2	10 0	
July 2	" Dividend on £1,802 0s. 0d. London & North Eastern Railway 3 % Debenture Stock	21	12 11	
" 30	" Refund of Income Tax on Dividends, 1923-24	12	18 4	
Dec. 31	" Dividend on £100 0s. 0d. 5 % War Loan, 1923-47,	2	10 0	
	Inscribed Stock	£103	19 10	
		£103	19 10	

We hereby certify the above Account to be correct,
 611, Fane Street, London, E.C.2.
 23rd January, 1925.

WILDE, FERGUSON-DAVEY, AND MILLER, Chartered Accountants,
 Auditors.

BRACKENBURY MEMORIAL FUND.

DE.

31ST DECEMBER, 1924.

CR.

1924.		£	s.	d.	1924.		£	s.	d.
Jan. 1	To Balance—brought forward	55	5	5	March 5	By Administration Fee, Royal United Service Institution	1	5	3
June 2	" Divided on 6431 1s. 6d., 5% War Loan, 1923-47	10	10	6		" Hugh Rees, Ltd.—Books	0	3	10
Dec. 1	Inscribed Stock ... ditto	10	10	6		" A. E. Walker, Ltd.—Card Index Cabinet	10	0	6
	Ditto				May 11	" Hugh Rees, Ltd.—Books	2	0	6
					June 6	" Hugh Rees, Ltd.—Books	1	19	0
					July 2	" Hugh Rees, Ltd.—Books	0	16	9
					Oct. 6	" Hugh Rees, Ltd.—Books	2	10	9
					Nov. 9	" Hugh Rees, Ltd.—Books	2	10	9
					Dec. 31	" Balance in favour of Fund	55	0	1
							276	0	5

We hereby certify the above Account to be correct.

611, FINE STREET, LONDON, E.C.2.
23rd January, 1925.WILFR. FERGUSON-DAVIS, AND MILLER, Chartered Accountants,
Auditors.

NINETY-FOURTH ANNIVERSARY MEETING

xi

TABULAR ANALYSIS OF THE STATE OF THE INSTITUTION.

[A full analysis for each year from 1831 will be found in the Report for 1897.]

Year 1st Jan. to 31st Dec.	Annual Subs. received.	En- trance Fees.	Receipts (from all sources).	Life Subs. re- ceived.	Invested Funds at Cost.	Invested in the pur- chase of Books, &c.	No. of Vols. in Library.	No. of Members on the 31st Dec.
1831	£ 654	£ ...	£ 654	£ 1,194	£ ...	£ ...	...	1,437
1841	1,450	...	1,643	186	6,000	243	5,850	4,243
1851	1,136	131	1,292	66	666	34	10,150	3,188
1861	2,122	305	2,899	266	2,846	99	11,812	3,689
1871	2,455	237	3,677	538	7,748	202	15,501	3,922
1881	2,893	238	4,967	645	13,670	240	19,920	4,577
1891	2,640	189	5,004	454	21,942	153	23,845	4,204
1901	3,816	197	6,955	358	14,192	289	27,792	5,443
1902	3,806	188	7,063	449	14,491	309	28,167	5,427
1903	3,743	178	6,597	409	15,459	299	28,387	5,361
1904	3,684	184	6,707	448	15,459	301	28,636	5,313
1905	3,713	253	7,756	611	15,459	324	28,851	5,369
1906	3,714	226	6,803	519	16,488	204	29,114	5,404
1907	3,733	211	6,615	573	16,549	256	29,427	5,408
1908	3,741	220	7,205	502	16,612	213	29,667	5,420
1909	3,806	312	7,354	789	16,676	167	29,917	5,535
1910	3,893	269	7,407	573	16,742	326	30,182	5,611
1911	3,988	254	7,319	372	16,810	374	30,624	5,649
1912	4,018	225	7,125	330	16,881	305	31,043	5,654
1913	3,928	159	7,113	266	*12,141	384	31,425	5,580
1914	3,780	101	7,570	98	*12,216	231	31,770	5,338
1915	3,534	46	8,332	77	†14,276	92	31,862	5,000
1916	3,443	13	8,595	344	†13,537	110	32,064	4,980
1917	3,407	—	8,853	446	§16,414	196	32,425	4,946
1918	3,440	—	9,135	337	||21,610	124	32,602	4,955
1919	3,654	—	10,332	1,065	¶22,736	347	32,824	5,160
1920	3,524	315	8,902	817	**18,014	267	32,994	5,196
1921	3,644	380	9,069	610	††18,421	307	††27,177	5,275
1922	3,730	401	8,853	609	§§19,148	270	††25,417	5,457
1923	3,980	463	8,856	549	|||18,993	219	25,747	5,671

* Value on December 31st, 1913.

† Value on December 30th, 1916.

|| Value on December 31st, 1918.

** Value on December 31st, 1920.

†† During the year a large number of Books of a non-Service nature were sold.

§§ Value on December 31st, 1922.

||| Value on December 31st, 1923.

† This includes £2,000 4½ per cent. War Loan.

§ Value on December 31st, 1917.

¶ Value on December 31st, 1919.

†† Value on December 31st, 1921.

THE CHAIRMAN: My Lords and Gentlemen, It is my pleasure to move the first resolution: "That the Report and Accounts, as circulated, be taken as read and adopted."

The Report and Accounts have been circulated and are in your hands, and I am sure you will agree with me that they show a very satisfactory state of affairs so far as the past year is concerned. I well remember the time when my father brought me to the old Royal United Service Institution as a midshipman, nearly fifty years ago, and introduced me to the then Secretary, Captain Boughey Burgess, and I took the greatest interest in this Institution from that time forward. I never thought then it would be possible for me to be the Chairman of the Council; in fact, I never even thought that I could possibly achieve the honour of being a member of it, much less its Chairman. But fortune has shone upon me, and I have now had the pleasure of being your Chairman for the past two years. I can truthfully say that I have enjoyed the work immensely. Since I have been Chairman of the Institution, its success has been greater than I could possibly have hoped for. Some of us fall into good fortune, and it just so happened that I was selected as Chairman when two or three very good pieces of luck, or rewards of merit, came to the Institution. In the first place, I am sure you will all agree that we felt it a compliment when His Majesty honoured the good work of the Institution in general, and the splendid work of our Secretary, Sir Arthur Leatham, in particular, by conferring upon him his personal decoration of Knight Commander of the Royal Victorian Order. I think that is a splendid thing to have occurred during my Chairmanship, and I am so pleased to think that I occupied that position when His Majesty thought fit to so honour our excellent Secretary. Then another great thing occurred during my Chairmanship. Owing to the efforts of Sir Arthur Leatham, the Income Tax Authorities disgorged a very considerable sum of money to us, and relieved us of such taxation on our premises for the future. In addition, Sir Arthur Leatham has been working very hard to have the rating of the Institution looked into with a view to getting its rateable assessment reconsidered by the Quinquennial Valuation Authorities, which takes place this year. It is a great satisfaction to me to think that when I leave office the financial position of the Institution will be better than it was when I was called upon to take the Chair, not, I am afraid, owing to any great efforts on my part, although I have tried to do a little. It is also my great pleasure to announce that Lord Horne has been kind enough to relieve me of the responsibility of Chairmanship during the next year. I need say nothing about Lord Horne, because his brilliant services at the front are so well known that it is not necessary for me to allude to them. Before concluding my remarks, I should like to thank the members of the staff who have contributed so largely to the welfare of the Institution. In the first place, there is the Secretary. I have already mentioned some of the duties he has performed and some of the benefits that he has conferred upon the Institution during my term of office. Then there is Major Parkyn, who is one of the best Librarians we could possibly have. Coming up in the train to-day, I happened to get into conversation with two Junior

Officers about the library; they told me that they found the library of the Royal United Service Institution of great assistance, and that it saved them much money because they were always able to get books there which they otherwise would have to buy. I am glad to say that we now have 5,812 members, and it is really a great compliment to the Council and to the Secretary that so few of them have attended here to-day to criticise our administration, and we can only conclude that they are thoroughly satisfied, and hope that that is so. Then I should like to mention that we have a new Editor of the JOURNAL. We have been fortunate in securing the services as Editor of Captain E. Altham, C.B., with whose distinguished war services in the Navy you are all familiar, and most of those present attended the exceedingly interesting lecture he gave here. The first number of the JOURNAL that he has edited is now in your hands, and I think you will agree with me that it is a great credit to him. We hope he will have even greater success, if possible, in the future. Then we have an Assistant Editor of the JOURNAL in the person of Lieut.-Colonel de Watteville, who assists Captain Altham on Army subjects. The Assistant-Secretary and Accountant, Mr. Pinhey, deserves a word of credit for the excellent way he has always done his work and the accounting, and is doing it at the present time. I am glad to tell you that, since I took office two years ago, nearly a thousand new members—993 to be exact—have joined the Institution; and I hope that under Lord Horne's administration the number of members will increase and multiply. The Air Force are approaching the Treasury with a view to helping us financially, and we also hope that Sir John Salmond is going to join the Council. In that way the Air Force will be more strongly represented, and we trust that more airmen will join the Institution.

My Lords and Gentlemen, I will conclude my remarks by thanking you all most warmly for the support you have given me during my term of office, particularly for electing me to perform the duties for an extra year. I took that as the very greatest compliment you could confer upon me. It happened owing to the fact that F.M. Sir William Robertson, who ought to have been my successor, asked to be excused owing to the large amount of time he had to devote to the performance of various duties in connection with the Service and his private affairs. I thank you again most warmly, and I wish my successor a most successful year of office.

COLONEL C. W. TROTTER, C.B., T.D. (Chairman of the Finance Committee): Mr. Chairman, My Lords and Gentlemen, I have much pleasure in seconding the resolution. The Chairman in his speech has said practically everything that it is necessary to say about the accounts. There is only one point I would like to make. In 1923 we had to sell £500 of War Loan, and at the end of the year we had an overdraft of £266. In 1924 we have sold no capital and the overdraft was £10 less. The deficit in 1923 was £446, and this year it is £823. But that is not as bad as it looks, because there is debited to this year's accounts £708 for the new edition of the Museum Catalogue, all of which will come back to us in due course. So that really the deficit this year is about £150. I think, therefore, we may consider the accounts as satisfactory. We want another £500 or £600 a year income to

carry us through, and in regard to that the Chairman has touched on three matters which ought considerably to help us. The first is that we hope to get a grant from the Air Ministry; the second is that we hope to get a reduction in the rates on the building; and the third is that we want to get additional members and increase the subscriptions in that way. We have got a very large increase owing to the efforts of Sir Arthur Leetham, and if that only continues I hope that our accounts will balance in the future. I am afraid we have to face a rather heavy expenditure this year in providing a new heating apparatus in the Banqueting Hall and its crypt, the old one being some seventy years of age, and H.M. Office of Works are doubtful as to its being safe any longer. The new one will cost, all told, round about £800, but the Finance Committee propose to treat it as a capital expenditure. I beg to second the motion.

GENERAL SIR EDMUND G. BARROW, G.C.B., G.C.S.I. (Chairman of the Journal and Library Committee): My Lords and Gentlemen, I have very little to say with regard to the JOURNAL and the Library. In regard to the JOURNAL, you are all aware of the changes that have recently been made in the editorial staff, as the Chairman mentioned that matter in the course of his opening remarks. The Chairman told you we have Captain E. Altham, R.N., as Editor, with Lieut.-Colonel de Watteville to assist him on the military side. We anticipate that, under this arrangement, the JOURNAL will be greatly improved and that it will be of greater use to the Services. I desire specially to call your attention to the paragraph in the Report, in which the Editor states: "There is still a regrettable lack of support from the Navy in both lectures and articles; and, with a view to ending any misapprehension that may exist among serving officers of the attitude of the Admiralty towards the Institution, an extract from a Fleet Order bearing on the subject has been republished at the head of the Naval Notes of the February JOURNAL. In this it is stated that 'Their Lordships desire it to be known that they wish to give every encouragement to Officers to join the Institution and to take part in its Essays, Lectures and Debates'." We all know that the wishes of the Lords Commissioners of the Admiralty are always regarded as sacrosanct, and we may therefore hope for a very large increase in the number of Naval Officers who will assist us by taking part in the Debates on Lectures and by reading Lectures and writing Essays. As regards the Library, I have little to add to what has already been said by the Chairman, except to quote some figures. We have increased considerably the number of subscribers to the Lending Library—those who really use our Library largely for educational purposes. That number has been increased by about one-third. That, I think, is largely due to the fact, not only that the Library is better known, but that we now have a great number of Air Force Officers who visit the Library and make themselves acquainted with the views of military and naval authorities on various subjects. That is all to the good. Another reason for the increase is that our excellent Librarian is most helpful to young Officers who attend the Library. I know for a fact (the information has been obtained from others and not from him) that a very large number of Officers do go to the

Library for advice as to what they should read in connection either with Lectures that they are preparing or the Examinations that they are about to face. In that way the Librarian is of the greatest assistance to them, because he not only knows what books he has in the Library, but he is useful in being able to impart his knowledge to those who come to him for assistance, and that knowledge is always most tactfully given. I therefore regard the increase in the Library as largely due, firstly to the aid given to it by the Air Force, and secondly to the great assistance given to Officers themselves by the Librarian. I do not think I need trouble you with any further remarks.

COLONEL C. H. COLVIN, C.B., D.S.O. (Chairman of the Museum Committee): Mr. Chairman, My Lords and Gentlemen, As Chairman of the Museum Committee, I desire to say that since the Annual Report was printed there has been a number of additional exhibits of an interesting nature kindly presented by Caroline, Viscountess Hill, all of which belonged to Field-Marshal Viscount Hill. (A complete list of them will be found in the current number of the Institution's JOURNAL.)

For those who care for models of ships, I should like to say that the model frigate constructed and presented by Mr. A. W. Nye is a very fine piece of work, and that it is on view in the crypt of the Museum. With regard to Regimental Colours, I would ask members to advertise the fact that the Institution repairs and adds the battle honours to Regimental Colours. A working staff of ladies is employed who are all near relatives of Officers killed in the late war. Last year 15 sets of Regimental Colours of various units were repaired by the Institution, and it assists the aforementioned ladies with small increments to their incomes. The exhibits lent to the British Empire Exhibition last year were all returned in perfectly good condition. The small falling off in the number of admissions to the Museum may be attributed to the counter-attractions of Wembley. I have had my attention called to the fact that the Imperial War Museum is forming a collection of swords dating back to the formation of the Regular Army, other than those of the Great War. Our Museum, as you know, is very rich in swords, and we can give every information about this weapon to enquirers. The Imperial War Museum was formed, I believe, purely and solely for relics of the Great War; but if they are going to start an historical Museum it may seriously interfere with our interests.

The resolution, "That the Report and Accounts, as circulated, be taken as read and adopted," was then put and carried unanimously.

MAJOR A. C. CHAMIER: My Lords, Ladies and Gentlemen, I have the honour to move the resolution that stands in my name on the Agenda: "That the thanks of the Meeting be accorded to the Auditors, Messrs. Wilde, Ferguson, Davie and Miller, for their services, and that they be re-elected Auditors for the ensuing year at a fee of forty guineas."

I am sure it is a source of great satisfaction to all the members of the Institution that the Accounts are presented in such a clear form that they are easily understood. I think if the Auditors were represented here to-day—possibly they

may be—they would probably be the first to admit that they owe a great deal to the excellent manner in which the Accounts are presented to them before they are put into their final shape.

LIEUT.-COLONEL LORD RAGLAN: I beg to second the resolution.

The resolution was then put and carried unanimously.

VACANCIES ON THE COUNCIL.

The undermentioned Officers had been nominated as candidates for the vacancies on the Council, as follows:—

Royal Navy (2 vacancies).

Admiral-of-the-Fleet Earl Beatty, G.C.B., O.M., G.C.V.O., D.S.O.

Admiral Sir R. G. O. Tupper, G.B.E., K.C.B., C.V.O.

Regular Army (4 vacancies).

Field-Marshal Sir W. R. Robertson, Bart., G.C.B., G.C.M.G., K.C.V.O., D.S.O.

General Sir E. G. Barrow, G.C.B., G.C.S.I.

General Lord Horne, G.C.B., K.C.M.G.

Lieut.-General Sir H. S. G. Miles, G.C.B., G.C.M.G., G.B.E., C.V.O.

THE CHAIRMAN: There are two vacancies on the Council for the Royal Navy and four vacancies on the Council for the Regular Army. As you will see from the Agenda, two Officers have been nominated for the Royal Navy and four Officers have been nominated for the Regular Army; and as no one else has been nominated to fill the vacancies, I am sure it is your desire that those Officers should be unanimously elected.

The resolution was carried unanimously.

THE GOLD MEDAL ESSAYS, 1924.

THE CHAIRMAN: I will ask the Secretary to report the result of the competition for the Gold Medal Essay, 1924, which was on the following subject: "Given, that there is maintained at Home in peace-time a Field Army of Five Regular and Fourteen Territorial Divisions, with Army troops; how can they be best organised to provide for expansion which a war on a national scale will demand?"

THE SECRETARY read the following Report by General Sir Ivor Maxse, K.C.B., C.V.O., D.S.O., dated 25th January, 1925:—

"Dear Sir, In reply to your letter dated 17th November, 1924, forwarding 15 Essays written by the competitors for the Gold Medal, I beg to report as follows:

"(1) In consultation with Colonel Bates and Captain Liddell Hart, three Essays have been selected and placed in the following order of merit:—

First, No. 6 Essay: 'Perseverantia et Industria.'

Second, No. 2 Essay: 'Be prepared.'

Third, No. 5 Essay :

'They only deserve liberty and life,
Who conquer them daily anew.'

"(2) It is the opinion of myself and the other members of the Selection Committee that No. 6 Essay is worthy of the Institution's Gold Medal.

"(3) In arriving at the above definite decisions, the Selection Committee have been actuated by the knowledge that the first consideration in the Military Essay is that its author should have a full grasp of his subject and should deal with it very thoroughly."

The envelopes containing the names of the successful competitors were then opened, and the Chairman announced the names of the winners as follows :—

First (No. 6 Essay): "Perseverantia et Industria."

Major L. J. Cowper, The King's Own Regiment, Risborough Barracks, Shorncliffe.

Second (No. 2 Essay): "Be prepared."

Lieutenant F. A. S. Clarke, First Battalion, The Essex Regiment.

Third (No. 5 Essay): "They only deserve liberty and life
Who conquer them daily anew."

Captain and Brevet Lieut.-Colonel R. H. Beadon, C.B.E., R.A.S.C., *p.s.c.*,
Royal Army Service Corps Training College, Buller Barracks, Aldershot.

ADMIRAL OF THE FLEET SIR F. C. DOVETON STURDEE, G.C.B., K.C.M.G., C.V.O.: My Lords and Gentlemen, It is my privilege to propose: "That the thanks of the Institution be accorded to General Sir Ivor Maxse, K.C.B., C.V.O., D.S.O., Colonel A. S. Bates, D.S.O., T.D., and Captain B. H. Liddell Hart, for adjudicating on the Prize Essays." It is a great thing for us to have three such distinguished Officers to adjudicate on the Prize Essays, and I feel that we owe them our hearty thanks for their labour. At the same time, I think we also ought to thank the members who wrote Essays and to congratulate those who have won Prizes on the great success they have achieved. I hope the Competition will go on from year to year, and that we shall have more and more competitors, because in this way the great value of the Institution will be increased.

GENERAL SIR EDMUND G. BARROW, G.C.B., G.C.S.I.: I have the honour to second the resolution.

The resolution was put and carried unanimously.

VICE-ADMIRAL SIR H. H. BRUCE, K.C.B., M.V.O.: I have much pleasure in proposing "That the thanks of the Institution be accorded to the following retiring Members of the Council: Admiral of the Fleet Earl Beatty, G.C.B., O.M., G.C.V.O., D.S.O.; Field-Marshal Sir W. R. Robertson, Bart., G.C.B., G.C.M.G., K.C.V.O., D.S.O.; Admiral Sir R. G. O. Tupper, G.B.E., K.C.B., C.V.O.; General Sir

E. G. Barrow, G.C.B., G.C.S.I.; General Lord Horne, G.C.B., K.C.M.G.; Lieut.-General Sir H. S. G. Miles, G.C.B., G.C.M.G., G.B.E., C.V.O."

LIEUT.-GENERAL SIR J. A. L. HALDANE, G.C.M.G., K.C.B., D.S.O.: I have much pleasure in seconding that proposal.

The resolution was put and carried unanimously.

GENERAL LORD HORNE, G.C.B., K.C.M.G.: My Lords and Gentlemen, I beg to move the last resolution: "That the thanks of the Institution be accorded to the Chairman for presiding at this Meeting." I desire to emphasise the fact which Sir Reginald Tupper has reminded us of, that he has occupied the Chair of the Council for a double period. He came to our assistance at a time when there was some difficulty in arranging for a successor, and I am sure the Report that has been presented to you to-day will convince you that during his double term of office the Institution has made great progress. If I may for one moment introduce a personal note, I should like to say that I am very proud indeed of the honour that has been conferred upon me by electing me to the Chair. I am very conscious of what a difficult task it will be for me to follow successfully in the footsteps of Sir Reginald Tupper, but I can assure you that I will do my best.

COLONEL LORD AMPHILL, G.C.S.I., G.C.I.E.: My Lords and Gentlemen, I have the honour to second the proposal, and I should only spoil the graceful words of General Lord Horne if I added anything to them. Sir, in accordance with custom on these occasions, it is my privilege to put the resolution to you, as the Chairman generally regards himself as precluded from putting the vote of thanks himself.

The resolution was then put to the Meeting by Lord Amphil, and carried with acclamation.

THE CHAIRMAN: Lord Horne, Lord Amphil, and Gentlemen, I thank you most cordially for the way in which you have received this last resolution. I am sorry to vacate the Chair. I have already occupied a great deal of your time in my opening address, so that I will now only once more thank you most cordially for the kind way in which you responded to the resolution.

The Meeting then terminated.

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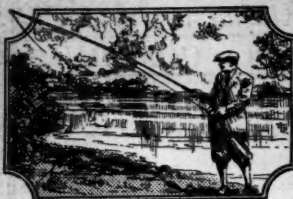
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on the successful list
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besides TWELVE of those nominated.

ANDOVER, 1923.

The only THREE OFFICERS assisted were successful.

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